

The University of Alberta Magazine / Summer 1970

new trail



Pollution . . . resource management . . .
finding food enough for the world
. . . in this issue, a special report on
New Perspectives in Agriculture

AGRICULTURE IN THE GOOD OLD DAYS. Here is the University threshing crew in September, 1918, working in the grain plots on the main campus. Dick Elvidge, an agriculture student, pitches the bundles, while Duncan Chalmers, the plot man, feeds the thresher. Sacking the grain is Guthrie Sanford, BSA '18, one of the first graduates of the Faculty of Agriculture and then a freshly appointed Lecturer in Field Husbandry. The hand with the pitchfork is Kemper Broadus, the University's first Professor of English. Photograph from Glenbow Archive.



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New Trail

The University of Alberta, Edmonton, Alberta

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On (and off) the Trail

With this issue, the circulation of NEW TRAIL leaps to 33,333 (more or less), a magic number achieved largely through the efforts of the Fund Development Office, where much time has been spent recently on a more efficient system of alumni records.

For most people the years spent at college come at about the same time they leave the parental nest and discover the world on their own terms. These are exciting years, and often as one's distance from them increases, so does one's remembered estimate of how exciting they were. So it is natural enough to value a continuing bond with *alma mater*, even if one is a bit cynical about why the connection is being fostered from the other end.

We do have ulterior motives in sending you NEW TRAIL, but our need for capital funds, important as it is, is not the principal one. The main reason is that a public institution cannot function for long without a broad base of public support, without a lot of people sympathetic to its needs and understanding its aims.

So we send you NEW TRAIL to tell you what we are up to.

Several people have asked us how we can afford to produce a magazine as apparently elaborate as NEW TRAIL.

A good magazine doesn't cost much more to print and mail than a bad one, and the good one is no doubt a much better messenger than the bad one, but too good a magazine may suggest that we have money to burn. Burnable money is the only financial problem we do not have, so we try to employ enough economies to keep to our budget, and to disguise the economies sufficiently to prevent their spoiling the magazine.

We did not invent many of our little economies, but the fervor with which we apply them is all our own. We do a lot of editing. Sometimes we cut sentences. Sometimes pages. We get into fights, but we keep to our page allotment. When the type is set, our choice of typeface (Times Roman, designed for *The Times* of London), together with the line lengths, margins, and spacing, permits us to get more words per page than most other magazines the same size, but without clutter or loss of legibility.

A coated ("gloss") paper is the usual choice for magazines, but the stuff we use is cheaper. It was originally manufactured for gothic novels and its pattern of wire-lines is reminiscent of hand-made paper.

With this issue, we have replaced the brown envelope with a brown wrapper that is bound with the magazine. Wrappers are cheaper than envelopes and do not require stuffing and closing.

In the next issue, we will again accept advertising. Are ads desirable in a magazine like NEW TRAIL? Perhaps not, but in any case before our circulation reached this level we could not carry advertisements without subsidizing them, so maybe they will help subsidize us now.

William Samis

New perspectives in Agriculture

Agriculture is the University's fifth oldest faculty, formed in 1915. Its traditional interests have been perhaps a bit introspective . . . improving the quality of beef, of wheat, of poultry. Only very recently has the focus changed. Now the Faculty has begun to take a broader view of its work, to relate it to more pressing social problems, problems of pollution, of misused and wasted resources, and perhaps most important, of the lack of sufficient food for the whole world. *Compiled by Jeanette Rothrock*



By Fenton V. MacHardy

Approximately twenty young women and one hundred young men will enter the Alberta universities this fall to embark on a career in professional agriculture. Other hundreds will enter schools of forestry, faculties of science, agriculture, vocational, and technical colleges to study biology in its many forms. A number of young men and women will cast their lot to follow their parents' footsteps and farm. What will be the collective role of these young people in the last quarter of the twentieth century? It would be extremely dangerous to attempt to answer this question in the context of Canada's agricultural past. To do so would be to disregard the gigantic forces that are shaping the future of our nation. Similarly, to think in the limited context of our own country would be to ignore the interrelationships that exist between Canada and all other nations.

If one is to define the forces that will

convertibility of carbon from one form to another, and our economic life depends in large measure upon the energy released by that conversion. Even our environment is affected significantly by changes in the quantitative relationship in which carbon appears. These transformations are readily recognized as the phenomenon of photosynthesis, energy metabolism, the formation of coal, oil, and gas, and the combustion of hydrocarbons to yield mechanical power, heat, and carbon dioxide. Because of the association with energy storage and release, these processes frequently are expressed quantitatively in terms of energy units. Thus we may speak of alternate energy forms.

At the present time, practically all of the energy requirement for sustaining life is obtained from agricultural production and from the seas. The energy for power production comes to a very large measure from the combustion of fossil fuels. The possibility of seeing these energy uses partially transposed must be considered in attempting to assess the long term future of agriculture. On the one hand, grain and other plant materials may be burned directly or may be distilled to yield

synthesis of proteins or starches from the carbon dioxide of the air eventually may be feasible using some energy source such as nuclear energy. On top of all this, it is also important to note that the fossil fuels form the major supply of raw material for the chemical industry. It is estimated at the present time that 3 to 5 per cent of petroleum and gas production may be used for this purpose.

Some perspective of the relative rates of agricultural and fossil fuel production can be gained by considering Alberta's grain and oil production. On a pound per pound basis, a yearly three hundred million bushel crop is less than 10 per cent of weight of Alberta's present oil production, which runs to a million barrels per day. On an energy basis, agricultural production constitutes an even smaller percentage of the total. In the United States, the energy required as food for human consumption constitutes only about 1 per cent of the total energy demand of the nation. Comparing the cost of energy, oil at the well head sells for about \$2.65 per barrel or 0.6 cents per pound. Grain sells for about 1.5 to 2 cents per pound (on an energy basis, the difference is even

The carbon atom and man



FRANK HALE

influence the future of agriculture, agricultural resources must be seen in the context of natural resources generally, and our total resource picture must be viewed in the light of economic, political, and other social forces. Is it possible to find a key or blue print to these interacting forces that might allow a reasonable prediction to be made?

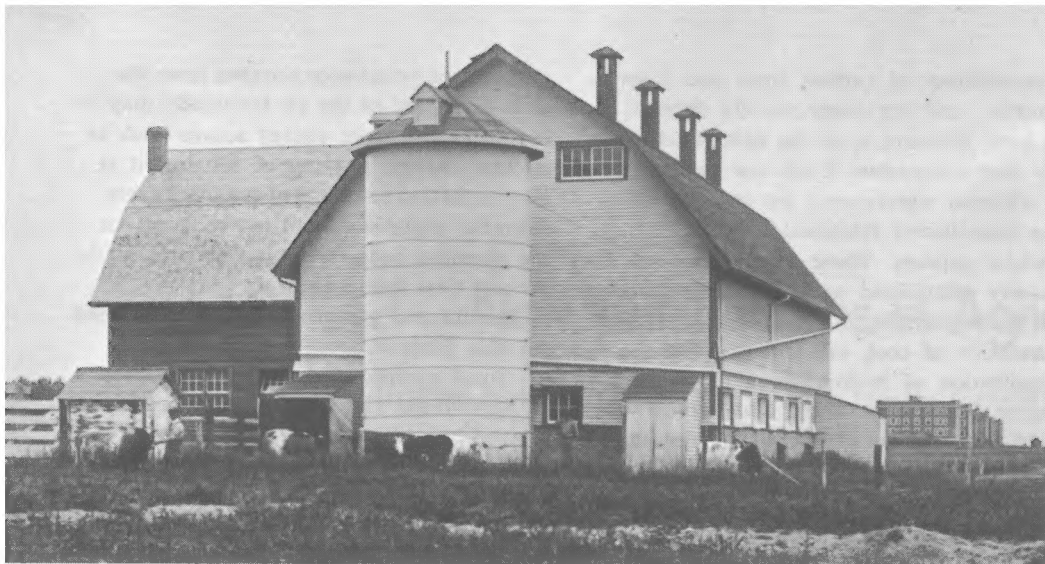
A logical choice might be to examine yet again the role of the carbon atom. Carbon is the common element in our fossil fuels (coal, oil, and natural gas), all plant and animal tissue, and the air we breathe. Life on earth depends upon the

alcohol, which in turn may be used as a fuel. On the other hand, some fossil fuels may be processed to yield forms of protein that may be used as feed stuffs. The extent to which these energy substitutions develop is of very real significance to the course of man's existence on this planet.

The picture is complicated further by the fact that other energy sources may be substituted for the combustion of fossil fuels. Water power and nuclear energy are of the greatest significance. There is an additional alternative in supplying man's food energy as well. Direct

greater). From these crude calculations one might obtain a gloomy picture for agriculture. Should technology permit direct energy substitution between fossil fuels and human food, Alberta's agricultural production could be replaced entirely by but 10 per cent of our oil production, and at a price at which agriculture could not compete.

Does this foretell the possible end of agriculture as we know it? A close look at the energy requirements for power over the coming years tells a completely different story—a story that we are using up our fossil fuels at a fantastic rate and



Test plots for field crops occupied large, neatly patterned tracts of the main campus as late as 1960, when they were harvested for the last time in the face of growing pressure for land space and buildings. Much earlier casualties to the construction boom were the farm buildings north of University Avenue, the last of which was torn down in 1949 when the Government of Alberta claimed that part of the campus for the Aberhart Sanatorium. One of the original buildings on the Aberhart site was the cattle barn, ABOVE. It was built in 1916 to house academe's milk cows and work horses, moved to the newly-acquired University farm south of 71 Avenue in 1930, and burned down in the late 1950's the victim of small boys and big matches. Pembina Hall can be seen to the right of the barn.

that far from finding substantial additional uses, the world should be giving extremely high priority to the establishment of means to conserve the remaining fossil fuels. In fact we might conclude that it may be in the nation's interest to substitute some surplus agricultural production for fossil fuels.

It is not necessary to develop in detail the energy resource picture. This emerges from statistical data and the numerous projections that are prepared and published from time to time. If one recognizes the strong possibility that we in Alberta will be involved in some form of continental energy system, then some of the facts presented by M. King Hubbert for the United States in a recent publication, *Energy Resources*, are applicable to us. Mr. Hubbert points out that the fossil fuels are non-renewable and that we are using them up at an incredible rate. He estimates that the United States (exclusive of Alaska) already has reached its maximum rate of oil production and that production will now start to decline and will continue to do so. The same will happen to natural gas in the United States in about ten years. On a world basis he estimates that maximum petroleum production will be reached in about thirty years time. Following that, production inevitably will decline. Mr. Hubbert concludes that these are problems of immediate concern in the United States where two thirds of the production

of energy for industrial purposes is obtained from petroleum and natural gas. The picture for the world at large is very little brighter, when 60 per cent of the production of energy for industrial purposes is obtained from petroleum and natural gas and when the world's supplies will be exhausted in the very near future.

Looking to alternative sources of energy, Mr. Hubbert indicates that coal reserves could last for a century or two and that the only other source of energy capable of supplying an advanced society for any great number of years is nuclear energy.

This may come as a surprise to Canadians who may think that Canada (and the world) has an unlimited supply of water power. Mr. Hubbert points out that the total potential water power does not exceed the present total demand for energy and that much of this potential is located in the developing nations, rather than in the nations in which the present demand exists.

Turning to nuclear energy, he divides nuclear power plants into light water reactors which could quickly use all of the world's supply of uranium-235, and breeder reactors. Breeder reactors consuming only natural uranium or thorium offer, in his opinion, the only long term adequate energy source.

In summary, our society is dependent upon petroleum and natural gas to a high degree and even more important, we live

in a finite world where we already have established the capacity to consume completely these resources over the next few years. Let us add too that as we consume our coal, gas, and oil, the carbon dioxide content of the atmosphere climbs and that waste heat from the process of converting these fuels (or for that matter any other fuel) into power requires the cooling capacity of one sixth or more of all the run off water on the continent. Faced with these factors associated with our energy resources, how will economic forces develop during the next quarter century? How will government react, and finally then, what about agriculture and other renewable resource industries?

First it is imperative that Canada have an energy policy covering the entire range of energy sources including fossil fuels, nuclear energy, and renewable resources and that this policy must face up squarely to the long range as well as the short term issues. A long term policy, most Canadians would agree, should establish priorities in resource use. Ready agreement likely would be obtained on the basic philosophical concept that fullest use should be made of renewable resources as a means of conserving scarce non-renewable energy sources. It also might appear entirely reasonable that reserves of oil, gas, and coal should be conserved to ensure that adequate raw materials are available to meet the needs of society for manufactured chemical products—reserves that would last until there is an alternative source such as direct synthesis. A corollary to this objective would be that only oil, gas, and coal in excess of these requirements be made available for direct combustion. Alternative energy sources, particularly the consumption of uranium and thorium by breeder reactors, should be developed to yield a total energy production commensurate with the projected needs of the nation. Over-riding these simple long range policies would be the restraint that power generation from any source must not create unreconcilable

Fenton V. MacHardy succeeded C. F. Bentley, BSc (Ag) '39, MSc '42, as Dean of Agriculture in 1968. He first joined the Department of Agricultural Engineering in 1950 and became Professor and Chairman of the department in 1958. He is well known for his work in the development of improved farm machinery and farm building design and of a remote control guidance system for the farm tractor. He holds degrees from the University of Saskatchewan, Northwestern University, and the University of Edinburgh.

levels of carbon dioxide, waste heat, and other environmental pollutants.

The path to achieving these long term policy goals is strewn with short term realities. The first short term consideration arises from the weapons balance between the United States and Russia and the extent to which these nations' economic capabilities are tied to the maintenance and growth of military power. The economies of these nations may not be able to afford a rapid change to nuclear power generation to bring about any real conservation—governments of the two countries could in fact engage in an all out struggle to corner the world's remaining oil and gas reserves. Passing on from the matter of national security, there is very little incentive for resource-based industrial concerns to conserve resources for future generations. On the contrary, any voluntary switch to massive energy generation from nuclear sources can only be expected as lower cost options disappear. Last and probably most significant, governments might find it politically impossible to sell a program of resource conservation to the electorate when such a program would cut back on one of its own major sources of revenue, and also would lead to the disappearance of jobs—jobs upon which our society depends for the distribution of wealth. As a result of these considerations, the temptations that will be placed before the Canadian people to sell their non-renewable energy reserves undoubtedly will be exceedingly strong. There also will be strong pressures to see some move towards a continental currency policy or other arrangement whereby energy passage across international boundaries would not involve foreign exchange. The ramifications here should be obvious.

With these immediate pressures in sharp conflict with long term objectives, an array of possible outcomes presents itself. In attempting to predict the actual outcome, the basic premise has to be that man collectively can arrive at a consensus and that government then will be sensitive to this consensus and will translate it into policy. Starting with man right across the developed world, I believe he will recognize that living in a finite world will call for a basic change of guiding principles and that he will alter his value structure significantly. Specifically, I think he will accept the short term sacrifice necessary to achieve the long term goal of adequately conserving oil, gas, and coal for the non-fuel demands of future generations. The vanguard of this changing value

structure is with us now in the concern being expressed increasingly over the quality of environment, and even in the demands of youth for an international policy of sanity in foreign affairs. Backed by popular consensus, I believe government will harden its stand and will resist successfully the enormous pressures that will be brought to bear by short term interests for reckless non-renewable resource exploitation. From this policy will emerge a new equilibrium that is consistent with a finite world. This new equilibrium of necessity will place a price upon non-renewable resources that will insure their conservation. Industrial processes increasingly will strive to achieve the thermodynamicist's goal of reversibility—processes that approach the ideal. Much more attention will be placed upon renewable resource based industries.

Turning to agriculture specifically, the long term prediction is that agricultural land must be fully productive, yielding food, some chemical raw materials, and special purposes fuels for our society. Scientific effort must intensify to improve the conversion efficiency of the process of photosynthesis. In the year 2000, man will look back with incredulity on the period when farmers were paid to keep land black.

What about agriculture in the transitional period immediately ahead, when all the forces of international politics will be jockeying for position with respect to energy resources? A wise government would not lose sight of the future, and would ensure that during this period agricultural skills do not languish, that basic land productivity does not in any way suffer, and that scientific effort in the field of renewable resources be stepped up and directed increasingly towards the total energy concept.

My complete conviction that renewable resource based industries will have a constantly increasing role to play, leads naturally to the activities I see ahead for the Faculty of Agriculture. The continuing objectives of increasing agricultural productivity and produce marketability generally, and specifically as they relate to the competitive position of Alberta and Canadian farmers, must be supplemented with a general concern for renewable resource energy flow. The Faculty's present attempts to expand its base of operation to include teaching and research in forestry, and its interest in contributing to a much greater degree in understanding our northland ecology are, I hope, indications of the Faculty's recognition of its broadening area of responsibility to society.

Project research in Agriculture

By L. W. McElroy

In his "Review of Research Aims and Objectives in the Faculty of Agriculture . . .," Dean F. V. MacHardy proposed the creation of a core program of project oriented research which would be adapted to the needs of Alberta agriculture and which would complement existing individual research programs. This would result in a more efficient and effective discharging of the faculty's responsibility to the industry as a whole. Last year the Faculty of Agriculture Council gave approval in principle to progressing towards the implementation of such a program.

What is the project research program, and how much progress has been made? To date the program is simply a concept,

a largely untried administrative structure, and a number of concrete outlines for possible research programs. Project research cannot be considered in isolation from the traditional university approach to research, in which the individual professor and his graduate students working within a department structure constitute the functional unit.

On the other hand, cogent arguments can be advanced to the effect that in its pure form the individual scientist's mechanism of providing research answers tends to be haphazard and inefficient for the solution of many of the most important problems which confront agriculture today. To more effectively cope with these problems an organizational structure, designed to help break down department and faculty barriers and to encourage

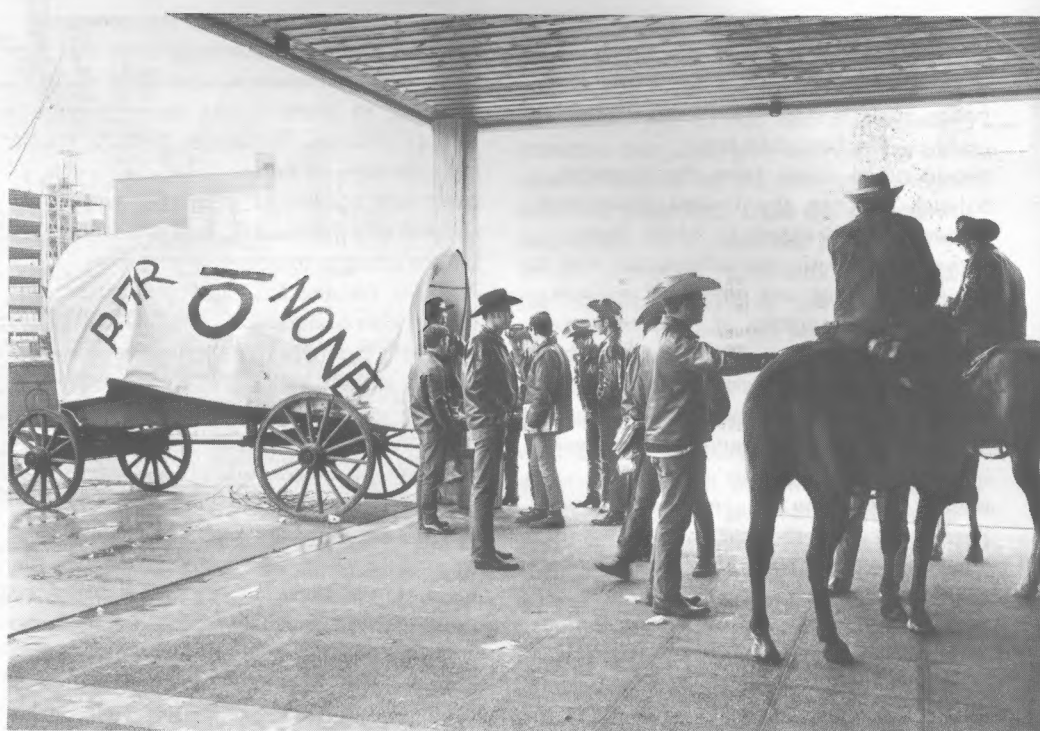
co-operative research by teams of scientists from different specialties, is required.

The primary functions of the Faculty of Agriculture are, of course, teaching and research as related to the needs of students. Thus individual members of the faculty cannot be considered automatically on call by the agricultural industry for research solutions to its problems. Nonetheless, throughout its history the faculty has recognized its special service role as the main agency supported by provincial funds responsible, in the common interests of producers, processors and consumers, for maintaining programs of research for the improvement of the production and distribution of food. If research at once can be improved and combined with service, so much the better. Faculty of Agriculture expansion into project research is directed toward this objective. It is in essence an attempt to evolve a mechanism whereby faculty members may supplement, or even replace, their individual research projects with mission-oriented research involving a team or multidisciplinary approach.

To get the proposal off the ground the faculty approved the formation of a Project Research Directorate, comprised in the first instance of the Dean (or his designate) and the Chairmen of the seven faculty departments: Agricultural Economics and Rural Sociology, Agricultural Engineering, Animal Science, Entomology, Food Science, Plant Science, and Soil Science. The first act of the directorate was to appoint "program review teams" in four broad areas of possible project research: economic productivity studies; plant-animal production and product utilization interrelationships; sub-Arctic renewable resources; and water and land resource use. These teams are made up of from six to twelve members each, with representation in all cases from the University, the federal and provincial governments and, in two cases, with a producer or agri-business representative.

The program review teams were given broad terms of reference—in brief, to "brainstorm" the areas assigned to them with a view to recommending one or more, preferably multidisciplinary projects which if implemented would have "a

L. W. McElroy, BSc (Ag) '33, MSc '34, was appointed Associate Dean of Agriculture (Project Research) last fall. He joined the University staff in 1943 and in 1951 became Chairman of the Department of Animal Science, a position he still holds.



The Agriculture Club still invites the whole campus to whoop it up at Bar None. But the Club's scope has been broadened to include an interest in serious problems of modern agriculture.

reasonable chance of providing benefit to society, or, in the harsh words of modern business, have a reasonable chance of some 'pay-off.' " The review teams were not supposed to worry about where the money might come from or who actually might do the research.

As this is being written final reports have been received from two of the four review teams. These reports include outlines of nineteen possible projects covering a very wide range of subjects from, for example, "water pricing mechanisms" to "conservation, improvement, and reclamation of sub-Arctic and Arctic surface environments."

After the recommendations from the remaining two program review teams are submitted, the directorate will be faced with the difficult problems of establishing project priorities and, at the same time, finding and allocating funds for those projects selected. Technically, the directorate will be responsible, too, for the appointment of project leaders. It is envisaged that normally project leaders will be faculty members, and that research teams will be made up of individuals (mainly faculty) who have volunteered an interest in a project and a desire to become part of a team. It is planned that research associates for the teams will be employed from research funds. The success of projects selected for study will depend

primarily on the co-operative efforts of those directly involved; co-operation cannot be legislated.

Agricultural producers as well as prospective research grant donors have expressed considerable interest in, and general approval of, the concept of project research. Both groups have indicated that, while basically satisfied with what the faculty has contributed to industry through the research of individual staff, they think the time is now ripe for well-qualified teams to concentrate more effort on integrated research in selected problem areas. Scientists working individually tend, perhaps understandably, to concentrate on individual phases of a problem; for example, production, processing or marketing of food with the chain, of course, being only as strong as its weakest link. Agricultural scientists have been accused of placing too much emphasis on the production phase—the team approach should make for a stronger chain. Considerable enthusiasm for the idea has been indicated, too, by research workers and administrators both within and outside the University.

All in all, the prospects are exciting for this new venture for the Faculty of Agriculture. Given continuing good will and flexibility to evolve administrative structures and processes, its success seems assured.

The Agricultural Club

By Francis W. Gardiner

The Agricultural Club was founded in 1911, four years before the establishment of the faculty itself, to maintain a kind of fellowship from which "Ag" students could gain their identity. The club always has been central to its comparatively small faculty, and, as a result, it has managed to maintain a group spirit envied by the rest of the campus. By tradition mostly social in its role, the club sponsors a variety of events for Agriculture students plus a major dance, "Bar None," which, as the name suggests, attracts students from every faculty on campus and persons from the community at large. Since its beginning the club has been held in high regard by the whole University as a symbol of co-operation and spirit within a faculty. The future holds more, however, and changes in perspective inevitably will alter the club's role.

Agricultural Club members traditionally have been conservative, down to earth, thoughtful, and hesitant about any new endeavors. With the advent of the New Left, concern for our environment, and generally the increased concern of man for his fellow, Ag students now are taking a close look at the future.

There are those who feel we have done well without being involved on a provincial or national scale and those who see the areas where we have failed in this regard. The general move now is toward a view that we will be concerned, that we will apply our knowledge to solving problems, and that we will play a more active role in life at all levels. It must be pointed out, however, that these ideas are new and by no means will they spring to life overnight. The Faculty of Agriculture has contributed a great deal in terms of production of feed stuffs, acceptance of new technology and so on, but now it is a much larger step to be concerned about the people who use this information.

This past year a large student committee was formed to survey the entire Agricultural Club, its past, present, and future functions. A list of student recommendations was drawn up and presented to the

Agricultural Club Executive, who in turn drew up a new constitution trying to embody as many of these ideas as possible. The most significant outcome was an apparent swing away from the social to the academic role the club could play.

One of the club's objectives is the formation of an intrafaculty student council made up of representatives from all disciplines of the Faculty of Agriculture, staff and students alike, to be concerned with the student life within the faculty, campus, and the province. The agricultural sciences are diversified and far-reaching with respect to modern living, and it is hoped that information will flow from this council to wherever it may be used.

The close co-operation between the students and professors in Agriculture always has given the faculty and the Agricultural Club the spirit and ability to function as they do. The students and

staff work together and have developed an open reliance invaluable to the advancement of any group. The future now will depend as much on the drive of the Agricultural Club and the students in it as on the staff members.

Co-operation, the ability to pull together toward a common goal, and the assurance that one is an important member only can aid the changes which are now under way. Involvement surely is coming, but it is the feeling of the students that we must never lose sight of the rewards that faculty life can offer if we are to maintain our best at any project we undertake.

We are committed, then, to letting the world know we are here, that we are concerned with its problems, that we can and will help, and that we want to keep the standard of that help very high.

Francis W. Gardiner, President of the Agricultural Club during the past year and closely involved in many of the changes he describes, received his BSc(Ag) at Spring Convocation this year. He attended high school in Red Deer and the Agricultural College at Olds. Beginning this summer he will turn his attention full-time to ranching on the family spread in the Porcupine Hills, southwest of Nanton.

Aquatic vegetation control

By William G. Corns

Population pressure, industrialization, and politics are causing increasing concern about the maintenance of a pleasant and healthful environment. Ecology has moved from relative obscurity to become a front page feature and a glibly used household word. Ecologists explain it as the interrelationships between organisms (including people) and their environment. In other quarters ecology has been defined by wags as the pseudo-science of the contemplation of the obvious. When human survival seems to be threatened by pollution—a dirty nine-lettered concept—there is a compelling reason to make use of the contemplation for practical, sensible action.

Proper management of water bodies is

one of the most vital tasks in this connection. Water and pollution can be related to almost everything. This discussion, however, is limited to aspects associated with control of aquatic plants, mainly at lakes. There are four main categories of aquatic plants: algae, small single-celled or threadlike bodies which form green, bluish, or brownish "blooms" or scums on the water and which, during decay, may produce a slimy, putrid mass; surface floaters, which cluster in a light green layer and move with wind and wave action; submerged plants such as pondweed and coontail which form dense, impenetrable masses in the water; and emergent plants, such as cattails and bullrushes, which protrude above the water and often grow in dense stands as complete cover in shallow water or unsubmerged soil.



Aquatic weeds, such as this mass which drifted ashore at Lake Wabamun, west of Edmonton, are a disgusting nuisance on recreational beaches and can cause a lake to pollute itself.

As weeds, aquatic plants affect domestic and industrial water supplies, irrigation, stock-watering, transportation, and swimming and boating activities. Nonetheless, it is important to appreciate that certain aquatic plants may help prevent pollution caused by soil erosion along shore lines and provide cover and food for waterfowl, fish, and other creatures.

Chemicals for control of aquatic plants achieve their best results in ponds and dug-outs and may be advantageous as sprays on emergent shore line vegetation in special situations, for example, lagoons. For the past two years we have co-operated with the Provincial Environmental Health Services Division in experiments intended to evaluate the efficiency of use of certain chemicals around rural district lagoons and the herbicidal toxicity, if any, to lagoon biological activity and final overflow water. The results so far have been encouraging.

Herbicides, when chosen and used properly at recommended dosages for aquatic weed control have not been shown

to have the pollution problems caused by persistence, build-up and food-chain consequences which resulted in the banning of certain insecticides such as DDT.

However, even though chemicals may not necessarily be lethal, undesirable side effects of herbicides and of any other foreign substances in the water, need to be known and avoided. For example, the oily 2,4-D ester which is effective against certain aquatic weeds is only permitted in bodies of water that do not contain fish. In some instances it was found to impart an off-taste to fish for several weeks. Much remains to be learned about the effects of any herbicide on organisms large and small.

In addition to provisions to avoid harmful changes in the natural balance of lake life which might result directly from toxicity of herbicides or indirectly from excessive reduction of plants required for food and shelter, there is another important concern. It is the sometimes detrimental increase in plant production caused by enrichment of the nutrition of the vegetation in lakes. A good example, much publicized lately, is the condition caused by sewage phosphate from the breakdown of household and industrial detergent wastes and possibly to some extent from rural run-off including substances from surrounding fields, barnyards, and feed lots. The added nutrients encourage rapid growth of algae and other plants.

Normally, algae are beneficial as part of food supply for fish, but when a soupy mass of over production decays, the associated loss of the water's oxygen supply, eutrophication, suffocates fish. In the absence of oxygen, non-oxygen requiring bacteria called anaerobic organisms can take over the decomposition of dead plant material and produce the dark, foul-smelling character of badly polluted water.

There are many other pollutants including some herbicides which can kill fish directly when the toxic substances are in the water from which the fish have to extract their air. Various biologists have stressed the delicate sensitivity of fish to pollutants and have stated, correctly no doubt, that if we protect fish we provide an environment where other animals can protect themselves. The conclusion is that fish can be our first line of defence against pollution and consequently it is a poor argument to say the loss of a few fish is not very important in comparison with the benefits derived from certain operations or industries that cause toxicity to fish.

The primary objective regarding all sources of water pollution should be prevention. Decisions and action should be based on sound research information and applied not only to recreational waters but also to other classes, especially those for domestic use, livestock, and irrigation.

It is pertinent to realize as well, that many natural "unpolluted" water bodies, particularly shallow ones, are not in a steady state or ideal balance insofar as potential animal-supporting ability is concerned. They are dynamic and under stress. They are gradually changing by plant succession, their bottoms slowly rising with vegetative matter and sediments as they become swamps and peat bogs in transition to forest cover. The shallower the water becomes, the faster this process goes. Warmed more and more in summers and frozen nearer to the bottom in winter, the water has decreasing oxygen capacity in both seasons and a net tendency toward having more wastes demanding oxygen. So in such habitats free of man's activities, there is a kind of natural self-pollution. It is relatively slow but ultimately has, for fish, results like those caused by excess phosphates from detergents. Indeed, because of eventual complete loss of the surface water the results become worse. Even the ducks disappear.

In addition, then, to response to needs for effective preventative and remedial

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action against man-induced pollution, there is a question concerning self-deterioration of certain aquatic bodies. Should not substantial energies be directed toward development of better understanding of modification, or halting of natural plant succession in certain aquatic and surrounding forest wildland habitats? Various vegetation control methods could be investigated. They could lead to

improvement of some of the declining ecosystems which, with continued care, then might yield more stable populations of plants and animals for health, enjoyment, and edification of generations of people, indefinitely. Although economic gains could accrue, such conservation objectives mean looking beyond immediate financial benefits.

interrupt malaria transmission over large areas of the world, cannot be wholly bad. No other insecticide could have done these things so cheaply, nor with such negligible direct hazard to the sprayers—and the sprayed; 500 million people have lived for years in houses sprayed thrice yearly with DDT with virtually no records of sickness traceable to this. Factory workers making it, day in day out for 20 years, are no less healthy than other people.

How much then, of the blame for the disaster rests with the users? How much with the manufacturers and their salesmen? Profits have been substantial from DDT and the profit motive has been evident in its abuse. The view that if one pound is good two pounds are twice as good is easily exploited. There is no honor in this. The marketing of insecticides should require the provision of details of procedures to detoxify them, in addition to the data on the hazards of their use. None can know for sure when this may be needed nor how urgently. If the environment must be done such damage, to keep the economy going, perhaps we have a sick economy and should cure this first. We are not yet so close to taking over a new planet that we can afford to ignore what we are doing to our present one.

There is indeed little honor to be gleaned in this situation; perhaps only for those who discovered the remarkable properties of this material, plus at best a handful of far-sighted entomologists who warned us early. Did we fail to listen because we have a generation gap at both ends?

Brian Hocking, MSc '48, is Professor and Chairman of Entomology, having succeeded E. H. Strickland in this position in 1954. Born and educated in London, England, Dr. Hocking studied an unusually wide range of subjects at the Royal College of Sciences, where he obtained his BSc with Honors in 1937. Prior to the war he worked in India as a ferrous metallurgist and later a teacher, and during his military service, he worked on stored products entomology for the Southeast Asia Command.

He joined the Department of Entomology in 1946 as an Assistant Professor, and in 1953 he earned his PhD from the Faculty of Science of the University of London. In recent years Dr. Hocking's main research interest has been insects and ecology in the far north.

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Profit without honor

By Brian Hocking

Could the widespread use of DDT be a disaster? This question was the title given by the late E. H. Strickland to a short paper which he wrote in 1945 (*Entomological News* 56: 85-88). He answered this rhetorical question with a qualified yes.

His qualifications were two. First, that DDT be proved to approach in effectiveness the claims then made for it; second, that it be employed on a widespread scale, over large connected areas. Both requirements have been met. For once, a commercial product has indeed met the claims made for it, at least with regard to initial effectiveness. And DDT has certainly been used over large connected areas. Do we have a disaster on our hands? Or have we heeded this twenty-five year old prophesy in time?

When Strickland wrote, little was known of the persistence of DDT and less of its cumulative build-up in food chains. Yet

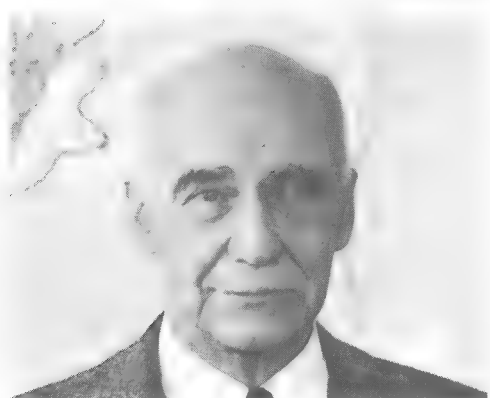
he correctly foresaw the hazards of threatening the maintenance of populations of predators—at any level.

It can be estimated that about 4.5 million tons of DDT have been produced and most of this has been released into the biosphere. This would represent a quarter pound per acre of the 55.5 million square miles of the land surface of the earth, or 2.4 pounds per arable acre. And for many years now DDT has not been alone; other chlorinated hydrocarbons with general toxicity and varying high persistence have joined it. It is now known that much of the DDT is in the atmosphere, much in the oceans, and much in the top ends of food chains.

Its half-life in the soil may be rather less than 10 years. These figures have serious implications. Good control of mosquito larvae could be obtained in many areas with an application of .03 pound of DDT per acre per annum. It seems inescapable that the insect fauna of the world must by now be so altered that we shall probably never know in any kind of detail what it was like before 1944. This, to an entomologist, is disaster; it will take decades, if not centuries, for a measure of normality to return; how long the first breakdown product, DDE, remains as a hazard in the environment is unknown. None can say how many species, potentially valuable, have gone for good. Let us hope we have at least learned the lesson that persistent broad-spectrum insecticides must be rigidly limited to narrow spectrum applications.

Looking back, one wonders just how this came about. A chemical which can stop a typhus epidemic instant and

Dr. Strickland



The farm animal waste problem

By J. B. McQuitty

As a result of economic pressures, livestock production today is in the midst of revolutionary change. The trend is towards larger and larger units of production. Total confinement systems are used in the broiler and pig industries and for egg production. Milk is being produced increasingly under year-round total or partial confinement systems.

This trend towards highly specialized, large scale production, involving hundreds and even thousands of animals per unit is creating new problems and exaggerating some which already existed. The problem of the handling and disposal of animal waste from these units is one which is rapidly assuming major proportions. In some respects the situation is parallel to the problems of urbanization, for whether they be people or livestock, their concentration in one location creates waste disposal problems with the attendant risks of water pollution and smell nuisance. Again, the fact that agitation prior to emptying storage pits on the farm brings about the release of toxic gases arising from decomposition during storage illustrates the further grave concern with which these wastes must be regarded. Reports of fatalities among both humans and livestock arising from these gases emphasizes the point.

The waste problem associated with farm animals is of a magnitude which is not often appreciated. The organic waste generated by 1,000 humans is equivalent to that of 89 horses, or 61 cattle, or 410 sheep, or 530 hogs, or 71,400 chickens. A beef feedlot covering a quarter section (160 acres) and containing 24,000 to 25,000 head has a potential waste problem equivalent to a city with a population of some 400,000 (Edmonton, for example). The treatment of all the feedlot wastes in a fashion similar to a city's facilities for 400,000, involving a multimillion dollar investment, would be unthinkable. In any case, the nature of animal wastes is such that they cannot be readily treated satisfactorily by the standard methods used in municipal plants. New methods or modification of existing

methods must be found for treatment and disposal of farm animal wastes. While physical treatments of waste such as drying may be appropriate in certain circumstances, economic considerations indicate that biological treatments must be used to tackle the problem.

There are two basic forms of microbiological breakdown of wastes— aerobic and anaerobic. Aerobic decomposition takes place when organisms have free oxygen (molecular or dissolved) present in their environment for their metabolic processes. Organisms that cause anaerobic breakdown do not require free oxygen for metabolism; in fact, they may be hindered by the presence of free oxygen. The anaerobes derive their oxygen from the compounds that they decompose.

The two decomposition processes differ greatly in their end products. Aerobic decomposition reduces animal wastes to organic matter of a simpler, less objectionable state. Anaerobic decomposition produces, in addition to simpler organic matter, water and carbon dioxide, other gases such as methane, hydrogen sulphide, and ammonia which have caused health impairment and even death when present in sufficiently high concentrations to livestock and humans.

Research into the farm animal waste problems has been slow to develop in Canada. The need was most pressing in European countries such as the Netherlands, Denmark, and the United Kingdom because of the intensive nature of their livestock industries and it was there that active programs of research were first developed. The problem **very soon** became apparent in the United States and over the past five or six years very considerable effort has been directed to finding solutions. While the results of this work are very valuable, climatic differences and livestock feeding and management practices in Canada are sufficiently different to necessitate the establishment of an active research program in this country.

The Department of Agricultural Engineering at The University of Alberta has a project related to animal wastes under study. In the spring of 1969, a

Livestock Environmental Engineering Laboratory was completed for the Department at the Ellerslie farm. This facility provides an opportunity for study of, among other things, certain aspects of the waste problem. The building is equipped with slatted floors in the livestock area, currently accommodating beef cattle. Storage pits below the slatted floors permit collection of the animal wastes. The building is ventilated by a pressurized system with the exhaust outlets located below slat level to minimize the rise of gases from the liquid manure or "slurry" into the livestock area.

The investigation is concerned with the effect of continuous aeration on the composition of and odors arising from the slurry and is financed by a grant from the Alberta Agricultural Research Trust. Two of the pits are subdivided by a wall running longitudinally down the centre of the pit except for five feet at either end. This forms an oval or oblong shaped ditch much like a racetrack. Aeration of each of the two ditches is accomplished by means of a mechanical rotor set across the ditch and operating in a 4 to 6 inch depth of slurry.

The beating action of the rotor blades introduces air bubbles, and hence oxygen, into the slurry and at the same time causes the ditch contents to flow round and round the ditch ensuring thorough mixing. Two other pits are used as controls in the experiment. Decomposition in these two pits is anaerobic in nature, similar to what is found in commercial practice where the same storage technique is frequently used. The aerated ditches are known as oxidation or Paasver ditches after the Dutch engineer who first used the principle.

Investigations in this particular subject are possibly the least attractive of any research field. The very nature of the material and the smells and dirty conditions associated with it tend to discourage work in this area, but better and safer methods of treating, handling, and disposal of farm animal wastes must be found if water pollution, smell nuisance, and health hazards to animals and operators are not to become a more critical problem in the next decade than they are today.

James B. McQuitty, Associate Professor of Agricultural Engineering, was born in Northern Ireland, and graduated from Queen's University, Belfast and Michigan State University. He joined the Faculty of Agriculture staff in 1966.

Agricultural adjustments in Canada

By T. W. Manning

Low farm income, the cost-price squeeze, the wheat surplus, the dairy situation, and many other farm problems are largely the result of basic maladjustments in agriculture. Output-increasing technology has been introduced into farm production faster than markets have expanded and resources have been able to shift out. As a result, farmers are able to produce more than consumers are willing to buy at prices that would yield profits comparable to other industries. Thus from an economic viewpoint, too many resources are being used in agriculture.

In view of the surplus productive capacity of Canadian agriculture, expanding markets can be considered desirable. The domestic market for food expands relatively slowly, depending primarily upon population growth. Efforts to induce greater food consumption probably would have only marginal effects, since most Canadians enjoy an adequate diet, and those who have inadequate diets are restrained primarily by low incomes. Industrial use of farm products is not highly promising because farm products are relatively high cost raw materials.

Export demands for Canadian farm products are influenced by many factors, some of which are beyond our control. The "Green Revolution" is making many of the lesser developed countries less dependent on food imports, and the poorer countries lack sufficient international exchange to purchase our products. In some important cases such as wheat, there is increasing competition among exporting countries for a shrinking international market. However, bright spots do exist in international trade for such things as rapeseed, meat products, and possibly feed grains.

The development of these potential markets will depend upon the relative competitiveness of our agriculture and the efforts we make to promote Canadian trade. One of the most effective means for expanding markets is to produce what consumers want at competitive prices. In order to become and remain competitive, greater efforts must

be made to reduce production costs. Appropriate agricultural adjustments can help make Canadian products more competitive in world markets.

There were about 430,000 farms in Canada in 1966—about 10 per cent fewer than in 1961 and 40 per cent fewer than the peak in 1941. Farm population declined from 3.1 million in 1941 to 2.1 million in 1961 and 2.0 million in 1966. Despite the relatively rapid decline in the farm labor force and an increasing domestic market for food, the shift has been too slow to permit farmers to achieve incomes comparable to the rest of the labor force. The farm population and labor force can be expected to decline about 50 per cent during the next 30 years simply because of fewer young people entering farming. Some additional decline may come through earlier retirement. The magnitude of decrease that may be necessary to raise farm incomes relative to nonfarm incomes is not likely to be achieved if present policies and conditions continue.

The excess capacity problem in agriculture cannot be solved solely by reducing the farm labor force—at least not within the range of reduction that reasonably may be expected. The highest economic category (\$35,000 sales and over) included only 2.4 per cent of the farms in 1966, but they accounted for 23 per cent of the total value of all agricultural products sold. In contrast, the 36 per cent in the small-scale category (less than \$2,500 sales) accounted for only 4.5 per cent of total sales. The Economic Council in its *Fifth Annual Review* estimated that output per worker in agriculture grows about 6 per cent per year. Thus if all the small-scale farms ceased producing, it would not offset one year's growth in labor productivity. If all the small scale farmers were to quit farming and sell or lease their farms to larger scale farmers, output probably would increase.

The area of land in farms did not change appreciably from 1941 to 1966 for Canada as a whole, but there was a considerable decrease in the eastern and central provinces and an offsetting increase

in the western provinces. The improved land acreage in Canada increased about 18 per cent over the 25-year period, and the acreage in crops increased 23 per cent.

Considerable land has been shifted from agricultural to residential, industrial, and transportation uses. The land added to agricultural use may have been less productive than the land that was taken out of agriculture. Nevertheless, agricultural productivity has continued to increase, and for all practical purposes adjustments in land use have not moved in the direction of reducing excess productive capacity.

Most agricultural land has limited use outside of agriculture. In the aggregate, land is much less mobile than labor. Only forestry uses land as extensively as agriculture, although outdoor recreation and wildlife refuges are also extensive land users. Urban uses are highly intensive, and a doubling of the urban population would require only a very small percentage of the agricultural land area. The mobility of land is strongly influenced by ownership. Nearly all of the agricultural land area is in private ownership, and in 1966 there were more than 400,000 individual landowners. Our tradition of private property rights gives each owner wide discretion in the use of his land. Not only does each owner or tenant exercise his rights of individual decision making, but he makes his decisions largely in ignorance of what the other 430,000 farmers are doing or planning. Although farmers in general may know that a particular aggregate adjustment is desirable, each one must make his decisions in the light of his individual circumstances and with very little knowledge of what others are going to do. As a result, land use adjustments may lag, fail to occur at all, or be excessive.

Land use adjustments within agriculture are slow, difficult, and costly. It is generally recognized that too much land has been devoted to wheat in recent years. Agriculture as a whole probably would benefit from a substantial shift from grain to forage production. For many farmers such a shift would involve a drastic change in farm organization and operation. Neither the land capability, the machinery and equipment on hand, nor the skills of the operator may favor a land use shift. In many cases substantial subsidies would be required to bring about long-run changes in land use. In addition, any announced program to reduce wheat acreage is not only too short run, but it is probably inadequate in rate of payments to bring about any substantial

change in land use. In addition, any temporary success that the program may achieve may be detrimental to needed long-run changes.

Most farmers would agree that they have difficulty in obtaining sufficient capital, but agriculture as a whole may be over-capitalized. The total value of farm capital increased from \$4.2 billion in 1941 to \$13.2 in 1961 and \$19.1 billion in 1966.

The large amount of physical capital employed in agriculture, other than land and buildings, is not due to resource immobility. The existence of too many uneconomically small farm units contributes to overinvestment in capital equipment. The nature of agricultural competition, with the emphasis it places on lowering unit costs of production, is another contributing factor. Farmers mechanize to produce more efficiently, but in doing so, they increase their total costs. Unit costs can be lowered with higher total costs only by increasing output more than total cost. Thus investments in many forms of capital force farmers to increase output in order to stay in business. The higher outputs tend to depress prices for farm products, and farmers find themselves in the familiar cost-price squeeze. Individually the farmer can escape the squeeze only by increasing his productivity faster than other farmers, but collectively the situation is made worse instead of better. This problem is general throughout the world so that restraining agricultural productivity in Canada would only make our agriculture less competitive in international markets.

Substantial agricultural adjustments have occurred, and they may be expected to continue to occur. Farm labor adjustments have been moving in the right direction but too slowly. Land use adjustments have been moving in the wrong direction as far as agriculture is concerned. The capital adjustments that have taken place are not necessarily in the wrong direction, but they may be of the wrong kinds. Effective agricultural adjustment requires not only a reduction of resource inputs to bring production in line with available markets, but a better balance in the kinds, qualities, and amounts of various resources in agriculture.

T. W. Manning joined the Faculty of Agriculture in 1962 as Professor and Chairman of Agricultural Economics, then a newly-created department. Educated at Oklahoma State University and the University of Minnesota, Dr. Manning's teaching and research interests include agricultural marketing.

Soybeans in human nutrition

By Harold Jackson

The soybean is one of the oldest crops cultivated by man. The first recorded history of the soybean plant in China was written in Sheng Nang's *Materia Medica* in 2838 B.C. Soybean protein is unique among plant proteins by virtue of its relatively high biological value. As a result this oil-rich legume has received extensive attention all over the world as a source of protein for the human diet.

Although animal products are the more desirable protein sources, they are more expensive to produce than plant proteins. This is due to the comparative efficiency of the yield of edible proteins produced per acre. A 10 hundredweight bullock can synthesize about 1 pound of protein every 24 hours, whereas 10 hundredweight of soybeans can give a crop equivalent to the production of about 82 pounds of proteins every 24 hours. Developments in this field are of particular interest now because of the ever increasing demand for proteins brought about by the rapid increase in world population.

The soybean is a highly nutritive crop, containing about 40 per cent protein, 20 per cent fat, and 20 per cent carbohydrate. It is a good source of calcium and vitamins A, B complex, and D. However, soybeans in their whole unmodified state are relatively indigestible due to the presence of antidiigestive and growth depressant factors. Soybeans also have a peculiar and undesirable "beany" flavor that is not easily removed. Therefore, they must be processed before being consumed.

In the orient, where the soybean has been an important source of dietary protein for centuries, in almost all cases the soybeans are either fractionated or modified by fermentation, generally with molds, but sometimes with bacteria, yeast, or mixed cultures of micro-organisms. Western people are not familiar with these foods although they are eaten by millions of people and are in fact amongst the most common foods on earth. Western processing methods include removal of the oil from the beans and heating the residues to drive off undesirable substances.

The resulting meal may be treated in a variety of ways to yield such products as flours, milk substitutes, and "texturized" products that closely resemble meat. Essentially the oriental methods are cheap, the western methods expensive. A few examples follow.

Soybean milk is a term generally applied to the aqueous extract of soybeans, similar to cow's milk in appearance but considerably different in composition and flavor. Soybean milk manufactured by modern factory techniques is distributed on a daily basis in Hongkong, Singapore, Philippines, and Taiwan. In North America spray dried soybean milk is commonly used for feeding infants who are allergic to cow's milk.

Soybean curd or tofu is made by adding acid or salts to soybean milk to form a curd which is pressed to remove sufficient water so that it is solid enough to be handled. The finished curd has the consistency of cream cheese. Fresh *tofu* contains 80 to 90 per cent water, 5 to 8 per cent protein, 3 to 4 per cent fat, and about 2 per cent carbohydrate. Because of the high moisture content *tofu* is subject to rapid microbial spoilage and generally is prepared and consumed daily. *Tofu* is the most important form in which soybeans are used in the human diet.

Soybean cheese (sufu): Due to the rapid spoilage of soybean curd, attempts have been made to preserve the product. *Tofu* is cut into smallish cubes and heated to destroy microbial contaminants. On cooling, the cubes are inoculated with selected cultures of molds and incubated for several days. The cubes are placed in a solution of 12 per cent salt or 10 per cent ethanol and allowed to age for about two months. The cheese then is bottled, sterilized, and marketed as *sufu*.

Harold Jackson, PhD '63, came from Nottingham, England in 1961 for graduate study here. Upon completion of his doctorate he joined the faculty, and is now Associate Professor of Food Science. At present he is on sabbatical leave at the Food Research Institute, Norwich, England.

Soy sauce is a dark brown salty liquid made by fermenting soybeans with wheat or rice and is used as a condiment.

Tempeh is an Indonesian food prepared by the fermentation of whole soybeans. The beans are soaked overnight to loosen the outer skins. The skins are removed and the beans are heated and then inoculated with a mold culture. During fermentation the beans are bound together by the mold mycelium to form a compact cake, which may be sliced, dried or roasted, cooked in soup, or fried in deep fat before being eaten. *Tempeh* fried in deep fat and salted to taste makes a particularly delicious snack.

Spun soybean protein. Apart from soybean milk and milk substitutes, the most sophisticated soybean product is spun soybean protein. This material is of special significance because it can be manufactured into products with the texture of meat. Isolated soy protein in solution can be extruded through spinnerettes into a coagulating solution, forming very long fibres or threads. These fibres can be processed into a variety of food products, and under properly controlled conditions any type of texture or degree of "chewiness" can be achieved. Due to the fact that spun protein fibres are white in color and have a bland flavor, artificial color and flavor may be added to make a particular simulated meat product. It is fair to say that the manufacturers have achieved considerable success with regard to texture, but the flavor leaves something to be desired.

An investigation was started in the Department of Food Science in 1963 to produce an inexpensive palatable soybean food with good storage qualities. The work was initiated by Y. D. Hang, MSc '65, then a graduate student here and now a Research Associate at Cornell University. An attempt was made to combine certain aspects of the traditional oriental methods with certain aspects of western cheesemaking techniques to produce a material similar to *sufu* (soybean cheese) but with superior keeping qualities and palatability. The method involved the utilization of rennet, skim milk powder, and cultures of lactic acid bacteria. The addition of skim milk powder and rennet speeded up the manufacturing process and improved the nutritional value of soybean cheese, but the "beany" flavor remained.

The investigation was continued by D. J. Schroder, BSc (Ag) '64, MSc '69, another graduate student who has since commenced a doctoral program at the

University of Minnesota. Now, if the process is begun with a tasteless, bland soybean milk, it is possible to produce a soybean curd that is completely devoid of any flavor whatsoever. Tasteless soybean curd certainly does not sound like an appealing addition to the dinner table, but the addition of various flavoring compounds to the curd can yield products of almost any desired flavor. Furthermore the curd can be treated in various ways to give a range of materials with a texture similar to meat spread, meat loaf, sausages, bologna, and the like. Evaluation of various products by taste panels showed them to be perfectly acceptable meat product substitutes. The approximate cost of the products would be about 10 cents a pound, based on the cost of raw materials. A retail price of 30 to 35 cents a pound would appear to be possible. Actual details of the process cannot be released as negotiations are underway for the commercial development by a major manufacturing company.

The soybean protein curd developed at The University of Alberta could play a significant role as a source of protein in both developed and developing countries. The curd can be transformed into a whole range of products to suit particular tastes, preferences, and local habits. This is very important as acceptability is a major consideration in any world food program aimed at persuading man, *en masse*, to change his food habits. At

a time of rapid population increase, necessarily accompanied by an increased demand for protein, the soybean would appear to have the most immediate potential for alleviating the protein shortage. In the long run more exotic sources of protein, such as microbial protein, will be necessary.

Our optimism with respect to man's ability to meet the ever increasing global demand for protein must be tempered by the fact that the protein must be made available to those who need it. Although it is generally recognized that about half of the world's population is starving both for calories and protein, it is not generally recognized that there is not a food shortage on a global scale. The following figures illustrate the extent of some surpluses in exporting countries: wheat—63,000,000 tons; rice—5,600,000 tons; butter—550,000 tons; skim milk powder—500,000 tons.

It is perhaps the most cruel paradox of modern times, that while much of the world faces deprivation and starvation, some nations suffer the burden of mountainous surpluses of wheat and dairy products. How do we get the right food to the right place at the right time? These surpluses are unavailable to the needy for political, economic, and social reasons. Until solutions are forthcoming to these problems the scientific and technological progress in increasing the world food supply will be no use.





Cattle at Kinsella

At Kinsella, ninety-five miles southeast of Edmonton, The University of Alberta has been working for the past ten years on a project to produce a new breed of beef cattle.

The experiment was started in the fall of 1960, with the help of a \$200,000 grant from the Horned Cattle Trust Fund. About half of the grant went to purchasing a ranch of some 5,600 acres of rolling brush and grassland, which is held under title by the Alberta Department of Agriculture and leased to the University for a dollar a year. The remainder of the initial grant bought cattle, buildings, equipment, and improvements; an additional grant of \$55,400 was obtained from the same fund in 1964 for the building and equipping of a performance test feedlot which accommodates up to 300 calves.

The ranch exists with four aims in mind: to facilitate a detailed study of inheritance in cattle so as to gain a better understanding of how to improve their efficiency and productivity; to develop improved and practical methods of breeding and selection which can be adopted by cattle producers to make their own breeding operations more scientific;

to study hybridization in the foundation of improved strains of beef cattle; and to provide cattle of known background for detailed studies in physiology, genetics, and nutrition.

There are two distinct herds at the Kinsella Ranch. One was built on a purebred Hereford foundation. The other, described by a visiting stockman as "the blamest mixture of colors in cattle I ever did see in one field," was started by crossing Angus, Charolais, and Galloway breeds. The Hereford herd acts as a control with which to compare the hybrid herd over a period of time under the rugged conditions in which it is being developed.

The breeds for the hybrid herd were selected to complement each other in their own qualities and for superior characteristics in their own right. Galloways were chosen for their hardiness, Aberdeen Angus for their carcass qualities, and Charolais for their growth and meatiness. The Hereford, chosen for the control because it is the most common breed in the province, was left out on purpose. It is hoped that the hybrid will develop into a line useful on its own but particularly good as a cross. Crossing potential with

the Hereford, then, would be enhanced because it contained no Hereford blood.

The two herds are treated alike in all respects. Except for groups sorted out for breeding or for special experimental purposes, all breeding females are run together. Both herds winter on the range, grazing for their own roughage as long as they can get through the snow to the grass and receiving a minimum of supplementary feed. Selection is directed towards adaptability to and productivity under range conditions.

Performance records are kept of animal weights, reproductive performance, feed consumption, and carcass data of test animals and culls from the herds.

Some aspects of adaptability and productivity are not well understood as yet, and research is in progress to clarify them. Examples of areas needing more definition include the importance of milk production in beef cows, genetic factors involved in superior conversion of feed, factors affecting conception and calf crop percentages, factors influencing carcass merit (in fact, what constitutes carcass merit itself), and, of particular importance to this project, how to measure winter hardiness.

Now there are some 350 cows and heifers aged two years or older on the ranch. Each year one hundred to one hundred and fifty cows will be bred straight in each of the two main herds. The Hereford herd is open to outside breeding so that it may more nearly reflect the performance of the breed if top selected sires are introduced and their progeny allowed to compete in the performance testing program. The



hybrid herd probably will remain closed for the next ten years before a decision is made on another course of action.

The Kinsella Ranch facility has made possible a number of studies of interest and potential benefit to Canadian cattlemen. Some of the recent experiments conducted there include carcass merit assessment and evaluation of factors influencing carcasses, winter management for productive efficiency and economy, summer management for maximum breeding efficiency, genetic and environ-

mental factors affecting growth, development and productive traits, and studies on energy needs with a view to specifying feed requirements as influenced by weather conditions such as temperature, wind velocity, humidity, and solar radiation.

Thus, the ranch means not only the production of a new breed of cattle designed for western Canadian conditions, but a steady stream of new, useful knowledge about the whole business of beef and beef breeding.

The hybrid strain being developed at the Kinsella Ranch is based on three breeds—Aberdeen Angus (FAR LEFT), Galloway, and Charolais. The calf, ABOVE, is an example of the progeny; though he is shaggy and buff-colored, his siblings may be black or smooth, horned or polled.

BELOW: The motley Kinsella herd. During the winter, the hybrids and the Herefords are run together on the range. In the spring the animals are sorted, weighed, and tested for hardiness. Ability to withstand the western Canadian winter is an important basis for selected breeding in both herds.



Dean Howes glances backward

E. A. Howes was an Ontarian of Irish descent and Irish humor. After he graduated from the Ontario Agricultural College at Guelph, he taught for a period at the University of Nevada, then came to Alberta to be Principal of the Agricultural College at Vermilion from 1913 to 1915. That year he was persuaded to remain in Alberta rather than return to Nevada, and he agreed to become Dean of a new Faculty of Agriculture at The University of Alberta because "it was more worthwhile to be a small toad in a big puddle than to be in the opposite position." With his appointment in May, 1915, the Faculty was established, though it had no facilities and no staff, save for the Dean's Special Assistant, George Harcourt, who had been appointed at the same time. E. A. Howes was, he said himself, "a Dean without a Faculty, apparently requiring special assistance." He remained Dean until his death in 1940.

During the 1930's Dean Howes gave a series of radio talks based on recollections of his youth on an Ontario farm. Later, in 1939, his reminiscences were published as a book, With a Glance Backward, and these excerpts are printed here with the permission of Oxford University Press, Canadian Branch, Toronto.

As a youngster he had gone to the classic little red schoolhouse, a one-room affair in which boys and girls of all levels were massed together under the tutelage of one harassed teacher perched at a slightly elevated desk at the head of his polyglot class.

Each half of the room was occupied by a row of pine seats, long enough to hold five or six pupils—more if the attendance were large. These desks were plain to begin with, but through the years they had achieved individuality by the number of initials cut into their surfaces, not to speak of additional carvings of grotesque design. Of course, this was largely upon the "boys' " side. The two rear desks on that side also were decorated with a series of notches long the edges, a feature more useful than ornamental. You see, those back seats were occupied

in the winter by older boys who had arrived at the dignity of chewing tobacco. In consequence of this newly-acquired manly habit, it was necessary to have sundry holes cut in the floor to facilitate expectoration, and the notches in the edge of the desk were there for the same purpose as the notched sight on a gun-barrel. It takes some years of practice to shoot without sighting.

The blackboard was just what its name implies, except that it was black only when newly painted. Along the top was a group of lines cut into the board for the singing school. Below this was a bullet-hole, one of the show features of the schoolroom, ever since the day in a previous generation when some sporty lads loaded up an old gun-barrel and touched it off. A gouged desk top, and the broken back of the next seat, were also shown at the same time, as evidence of how a gun-barrel really could kick in a more rugged age. . . .

Only the basics of reading, writing, and rock-bottom arithmetic were taught, but it is somehow heartening to learn that Dick, Jane, and Spot had even more gruesome ancestors.

The public school readers of my boyhood days would stand comparison with present-day readers, but they had some peculiarities. It must be remembered that I am describing a day immediately before the introduction of modern methods of teaching the young to read—there was nothing phonic, or phonetic, about our



process. The child started off by learning the letters of the alphabet, if he had not already been taught these at home. Then he plunged into the interesting story of "Is it an ox? It is an ox. So it is an ox." Next he was given similar details about an ass. In the following lesson he really got action: there was a picture of some boys playing on what we called a "teeter," or see-saw, and the lesson was planned after the scheme of the school yell of today: "I am up! He is up! We can go up! So can we!"

So far the words were simple, but the next lesson was something yet again: "I see a jay by my egg." It went on for some length to give with almost legal verbosity the relation between the jay and the egg, and between both and the spellbinder who told the story. Invariably the child wished himself back with the "teeter."

The farm where Howes grew up was the old fashioned utterly diversified variety which grew several kinds of crops, maintained a small dairy operation, and boasted barnyard creatures of every possible sort. Their cattle contributed milk and cream for the family, the local cheese factory, and their own churning.

Once we bought two alleged Ayrshires and Father was derided for paying thirty dollars for each. I call them "alleged Ayrshires" in the light of a later acquaintance with the real type. From a breeder's standpoint it would appear that they must have been like Irvin Cobb's "alleged Jersey" of which he said "there must have been just one scandal after another in that cow's family."

The dog churn was not a machine for the churning of dogs; it was a patent motor invention, patent often infringed; that had for its object the utilization of some of the dog energy otherwise wasted, in working the dash churn that made our cream into butter. It stood on the shady side of some building and it did not add much to the scenic beauty of the stading at that. One saw first, and most of the time, an immense circular table that revolved about a bolt in the centre; the table surmounted a simple frame, and could be tilted to an angle necessary to cause its rotation, as the dog paddled up hill with the look of one sorely imposed upon. Under the revolving table and immediately under the travelling dog, rolled a wheel, and another wheel turned in sympathy just outside the power frame. The turning of

this latter wheel worked a jointed shaft up and down, and this shaft worked the churn dasher up and down until the butter "came," its advent announced by a collection of little yellow beads about the hole in the churn cover. The trouble with this dog-power was that you first had to catch your dog, before he could run away or dig in where you could not reach him—he soon learned the signs of preparation for churning. Our old Rover had, in addition, the trick of stopping the machine by hooking his head around the post of the frame to which he was tied, thus gaining a brief respite, until the cessation of the familiar sound of the churn brought someone on the run, when he immediately started again without being told. The expense of working this machine was small, since a dog's time was not worth much and there were plenty of dogs.

There were the annual events . . . the sheep-shearing in the spring, and in the summer, the Cattle Show. This was a regular rural fair, a time of celebration, which, at least for young Howes and his compatriots, extended long past the hour the show closed down.

Along towards the end of seeding, we took time off for shearing the sheep. The lambs had all arrived and indeed some of them had achieved a quite sturdy appearance; all the sheep were out on pasture, and last year's fleeces had begun to look somewhat shop-worn, and were not improving in appearance with the passing of days. Then, too, the rising daily temperature suggested the necessity of taking off winter woollens.

Shearing day was full of action. The first job was to pen the sheep within the barn-yard, a task rather more involved than turning them out had been. On the barn floor or stable floor, according to convenience, a trestle platform was set up, and all was ready.

Shearing day was a noisy day: the ringing clip of the shears, shouted directions to the boys, muffled bleatings of the patient on the operating table, falsetto replies of the temporarily orphaned youngsters, all joined to the continued voluntary chorus for which sheep are noted. The ewes may have looked somewhat ragged before the clipping, but their beauty was not immediately improved by it. Apparently the lambs were also of this opinion, because they often refused to recognize their mothers in the ridged and gouged and altogether shameless creatures that jumped from the table to

the floor and noisily sought after their lost ones.

The lambs, however, had no reason to adopt an air of exclusiveness, for this was often the day reserved for docking their tails, and while much can be said in favor of this practice, it was too much to expect it to receive the stamp of approval in the sheep world. . . .

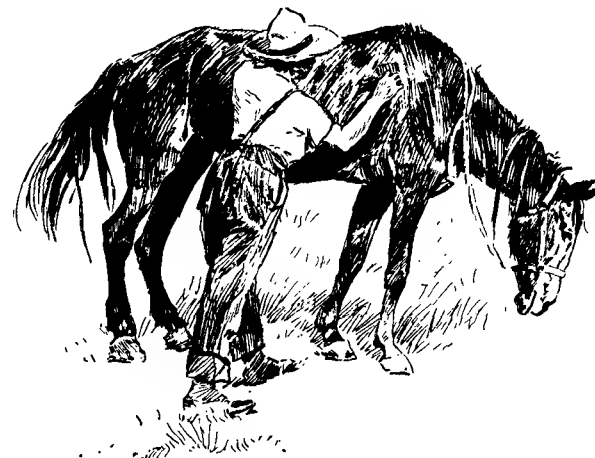
Those who were free of duties, and a few who were not, usually decided to spend the evening in town, where there was sure to be plenty of excitement; Cattle Show came but once a year.

There were five hotels in the town and considerable drinking took place; a few did not even wait until the shadows grew long, before beginning to light up. Because of the drinking, and by custom and tradition, Cattle Show night was selected for most of the fighting that had to be done during the year. On this night there was a kind of annual rearrangement of the status and classification of those desirous of fistic prowess. Once a row started between a couple at the corner hotel; one was an earnest Scotsman, who wanted to settle the question on the bar room floor, but the other, apparently wanting more room for action, rushed out the door, challenging his opponent to come outside. When the Scotsman reached the street, his expected adversary was more than halfway down the block, and going strong. The latter afterwards worked near our place, and used to tell of the time that he ran—well, the mischief—out of Sandy So-and-so; we never questioned his veracity, for that would have spoiled the fun. . . .

Then there was the motor car, a contraption apparently invented for young men of Howes' age and Irish disposition.

In Ottawa in the early fall of that year of grace, 1905, a little group of us heard that Ketchum Brothers had in

their pretentious store at the corner of Bank and Sparks Streets, one of those horseless carriages we had been hearing and reading about. Eighteen miles away, Richmond Fall Fair was on, and we thought it a fruity idea to charter this contraption—with a driver of course—to attend the fair. This early automobile—may I call it that—was not the kind we see played up in pictures today—a buggy with a driving bar and presumably some engine underneath. No, this was quite a step away from the buggy. I would say it was more after the style of a hotel-depot bus, for the main body had two longitudinal seats that were reached by a hanging step in the rear. The driver's seat was wide and had a dash board—I think there was no whipsocket. The driver used a wheel instead of a rod, if my memory is correct. There was an outside chain drive. We paid the same toll as for a team of horses; I know for I paid for it. The capital city was still in the grip of the capitalists. As we groaned and ground our way over the macadamized road to Richmond, we could not keep out of our own dust, and all the dogs in the country chased us. Arrived at the fair grounds, the management asked us to drive around the race-track. It was a glorious afternoon, and I still have in my memory a picture of that crowd—in buggies, on wagons, on boxes, on the rail—all looking at us—"rubbering" we called it then. I stood on that rear step and harangued the crowd, midway fashion, about the cataclysmic changes that evil-smelling wagon portended. . . . I shall not soon forget that automobile, for we scared the horse of a young man upon whom I earnestly desired to make a good impression. He told his family that it was a pretty wild chap the youngest sister was going with. I was having trouble enough as it was. I suppose that, having gone so far, I should finish by saying that it took more than an automobile to stop me, at that time.





Eulogy for an old haunt

By Katherine Govier
NEW TRAIL Staff

. . . Yes, that little shack is a rare fusion of brisk commercialism and cloistered learning. There the atmosphere of erudition is diffused over a sordid traffic in food-stuffs, vehicles, and periodicals. Theories of time and space are wafted about cheek by jowl with quotations in butter, shoe laces, and washing compounds.

"The Crystal Gazer of Tuck"
Evergreen and Gold, 1922

Scarcely an alumnus of The University of Alberta fails to remember Tuck. Tuck, for over fifty years the coffee-mecca of students, Tuck, the enduring dining hall with personality painted over its mirrors, Tuck of the thick smoke and tinny juke box.

Soon Tuck will exist only in these

memories—in old student newspapers, in the recollections of staff and students.

An insignificant notice in FOLIO (the staff bulletin) on May 7, 1970, read:

"Installation of this . . . sewer requires that the sewer and water serving the Tuck Shop be cut; for this reason the Tuck Shop will be closed permanently." A sad epitaph for a dead tradition.

What was the magic in Tuck? A most unassuming shabby shack to the outsider, it had a mythic history, shaded with uncertainty.

It was Bill Smith, a crafty Londoner, who set Tuck on its road to renown. He had the idea that a canteen would be of good service to the convalescent soldiers housed in what is now St. Stephen's College. And his canteen was a very

good service—he sold not only books and candy over the counter, but provided extra little services like taking bets on the horse races and providing the odd bottle of whisky for the needy. He called his establishment "Tuck"—a comfortable old English name for a little snack.

This was 1917. In two years old Bill Smith was on to a new scheme, and had sold his establishment to Eyrl and Warren, two of his best customers. Tuck was about to present its second face.

In October, 1919, when the University re-opened after the war with a greatly increased enrolment, there appeared in *The Gateway*, a fledgling gossip-sheet, a new advertisement. "The Varsity Tuck Shop, opposite the Convalescent Home (Alberta College). See us before going to town, and save time and money. TRY OUR COFFEE—Eyrl and Warren, proprietors." Whether because the campus, swollen with returning soldiers to 1,500 students, was ripe for a coffee house, or whether there was a magic in the building itself, Tuck as an institution was well launched.

Proprietors Eyrl and Warren immediately

LEFT, this was Tuck, Summer, 1970, in its death agonies, besieged by tractors and proving the writing on its walls—*Engineers Rule the World*. RIGHT, Tuck in its prime, circa 1940, with dormer windows and ivy-covered pillars. It looks like home, and that is what it was to many students.

BELOW, inside Tuck was always the same, even if the booths were replaced, or a different woman pushed her cart down the aisles collecting cups. There was always coffee and companionship.



became popular with the students. Warren was tall and lean, is said to have been a cowboy before coming to Edmonton, and had the most cheerful face to see behind the counter. Eyrl, his cohort, had a lame leg, but was as active as any he served. The proprietors sat around their tables jawing with the coffee drinkers, while students rang up their own purchases on the cash register.

By now the building was twice its original size, and Eyrl and Warren kept adding. Enlargements were made to the inside area in 1922 and 1924 to make room for the growing crowd of students.

In 1928, Eyrl and Warren sold out. This time it was Sam McCoppen, "the Jolly Undertaker," who took the business in hand. Mr. McCoppen made Tuck Shop into the distinctive structure it was until this summer. It was he who extended the front right to the property line, and in fact, just a bit beyond. One of the many rumors extant about Tuck is that a city bylaw says it should never have been built in the first place, that it was too close to the street. Legally, if it were torn down, it could never be rebuilt. It could only be added to or built around, and it was.

Close observers of Tuck Shop's growth would attest to the truth of this rumor. It is a good explanation for the weird construction of the building. One professor who had a student who lived next door to Tuck swears that this family's chicken coop was incorporated in the south end of the building. Any one could see where, at the north end of the building, about one foot above ground level, the ends of a set of street car rails protruded. An inventive builder had improvised on his reinforcement beams. The attic, according to the Honourable Edgar Gerhart, BSc(Pharm) '48, LLB '60, Attorney General of Alberta, and one of

Tuck's former owners, was a forest of vertical siding, and from underneath Tuck looked like an old warehouse full of packing crates which bent and groaned when the herds of students galloped in.

A second undertaker took charge of Tuck Shop after Mr. McCoppen sold. He was Cliff Roy, later a city alderman, and in 1941 he purchased the building. He made his name remembered by his amazing ability to produce rationed chocolates. He had a "chocolate priority list" for his customers.

One of these sweet-toothed customers was Edgar Gerhart, at that time a pharmacy student. When Mr. Roy left the

business in 1947, Tuck Shop came into the Gerhart family.

"I was in second year Pharmacy at the time. It looked pretty much a different place then. There was an old dance hall downstairs, hardwood floors, and Spanish pillars in front. We separated the pharmacy from the restaurant and remodelled the dining room and the kitchen for cafeteria-style service," Mr. Gerhart remembers.

The owner made more changes in the appearance of Tuck. He had the roofers put its name in colored shingles in the roof when he had the dormer cut out and the flat (continued on page thirty-two)





AMONG OUR ALUMNI

Chick Thorssen

By Jeanette Rothrock
NEW TRAIL Staff

Little more than thirty years ago, L. A. Thorssen, BSc (Civil Eng) '39, the new Chairman of the Universities Commission, was "Chick" Thorssen, a bookwormish, bright, and very popular engineering student. Since then he has ranged from professor and consulting engineer to industrialist to top level educational administrator.

Despite the quirk of fate by which he was born in the United States (while his mother was visiting her former home in Wisconsin), Mr. Thorssen is very thoroughly an Albertan. He grew up on a farm east of Calgary and attended a country school before moving to Calgary for high school. He enrolled in the science program at Mount Royal College for a year then transferred to the Faculty of Engineering (Applied Science then) at The University of Alberta.

During his senior year, Chick Thorssen was elected President of the Engineering Students Society. "That year," he recalled, "we practically ran the University—with, of course, the co-operation of the girls in Nursing and House Ec!" He graduated in May, 1939, at the head of his class.

Mr. Thorssen's career as an Engineering instructor began the subsequent fall, and during the war years he spent his winters lecturing at The University of Alberta and his summers working on war construction projects. He also carried out studies for the National Research Council on the properties of ice and the design for ice beams for floating airports, one of Winston Churchill's ideas, to be used as bases for lightweight anti-submarine bombers.

After the war he spent a year's sabbatical leave at the University of Iowa, where he obtained his MSc in fluid mechanics. He returned to the University in 1946 as an Associate Professor, and in 1949 he was promoted to Professor and Administrative Head of the Department of Civil Engineering.

It was during these years that Mr. Thorssen became actively involved in plans for what was then the new Students' Union Building (now it is University Hall) as a member of the Union's Advisory Committee. For his efforts he was made a life member of the Students' Union; he still is proud of that and of the building, which, he said, "was quite a thing for its time."

While he was at the University he had developed a considerable consulting

practice and was partner to a number of enterprises. In 1952 he resigned from the University (though he remained as a Sessional Lecturer for a time) to devote his full time to business. "Partly I wanted to see what made the world go round," he laughed. "But partly, too, I was getting tired of being an administrator and a professor with a hundred some students I didn't know and a researcher and a businessman all at once."

The following year he moved to Calgary, which has been his home ever since, and became an Executive Vice-President and General Manager of Standard Holdings Limited, through which he was a director and officer of several other companies.

Some years after his resignation from the University, he came back to the administrative side of education by accepting appointment to the Board of Governors of Mount Royal College in Calgary. At the time, Mount Royal was a private college seeking to become public, and Mr. Thorssen found himself presiding over the transition. When finally it became a public college, he was named to the new Board.

He resigned this position in 1966 when he was appointed to the new Universities Commission. The next year he left the Commission to become Chairman of the Board of Governors of the newly autonomous University of Calgary, which at the time was experiencing several administrative problems. It was with the help of Mr. Thorssen, more than any other single individual, that those problems were solved and the University set on an even keel.

But the chores of University administration are not known for the little time they take, and before 1969 was out the man who had left teaching in the early fifties in favor of industry resigned most of his business positions.

"There are some people who think I have holes in my head to leave a comfortable position in business for something that is a lot more work and certainly doesn't pay as well. There is more to life than being comfortable. You have to get a feeling of satisfaction from what you do."

This spring he was appointed Chairman of the Universities Commission, succeeding Andrew Stewart, who retired at the end of April.

Mr. Thorssen has some very clear ideas about what the Commission should and should not be. Through his sons and daughter and their friends trooping

through his home, he understands more deeply than most the currents of student thought and desires; and, as many of the administrators of the three Alberta universities are not only friends but former classmates, he has a vast informal communication with the campuses. Likewise, because of his years outside university circles, he has an ear to the opinions of the general public and a capacity for frank, reasonable discussion with the provincial government.

Communication, he says, is his main concern, and a real communication between the universities on the one hand and the government and the broader community on the other is what is needed most right now.

FORREST BARD



AMONG OUR STAFF

Fred Bentley

By Katherine Govier
NEW TRAIL Staff

Tall, tanned, and slow speaking, Fred Bentley is equally at home in his book-lined office and in Alberta wheat fields. His small office in the Agriculture Building seems to be a meeting place, long needed, for the scientist and farmer.

"In Europe, you know, agriculture is seldom taught at university. There, they concern themselves in academic circles with (if I may be a trifle slanderous) the true, the pure, the serene. Agriculture is considered vocational training." Dr. Bentley smiles wryly.

The effect of this low prestige and lack of interest in agricultural pursuits has been that developing countries have left their farmers and farming methods in the dusty past. In many parts of the world there is an attitude that agriculture simply goes on by itself, with no need for studied advance.

Not so in Fred Bentley's eyes. "From its inception, agriculture has been an art, a vital art—concerning the survival of mankind."

To the art of agriculture he brings the skill of the practitioner and the insight of the theoretician. The "practical man's" active response to problems combined with the thorough comprehension of the scientist make Professor Bentley a master of two worlds.

With characteristic familiarity with statistics, he explains the role of agriculture in emergent nations.

"One hundred and three years ago, at the time of Confederation, 75 per cent of the Canadian labor force was involved in agriculture. Now, that figure is less than 7 per cent. The five-fold increase in level of living we have seen in the last century is dependent on that happening."

The approximate figure for those engaged in agriculture in underdeveloped countries now is two-thirds of the labor force. The importance of upgrading the productivity of farming methods becomes clear as Dr. Bentley discusses his concern further.

"Agriculture exerts its profound influence on the economy from three directions. First of all, people who are not fed cannot work. Second, if farming methods are

inefficient, an overlarge percentage of the labor force is tied up in producing food, therefore other industries cannot grow up. And third, the large market made up of farmers is needed to buy from other sectors of the economy. If farmers are poor, if they buy no metal equipment, for example, there is little market for industrial products made in the country."

With the knowledge of these facts, Dr. Bentley went to work with CIDA (pronounced "seed"), the Canadian International Development Agency, a federal agency formerly called External Aid. Dr. Bentley was on leave last year, 1968-69, in Ottawa as the Agricultural Adviser to this group.

CIDA operates in Colombo plan countries, in the Commonwealth countries in the Caribbean, and in Francophone Africa. The aid given takes the alternate forms of educational aid, that is providing teachers; of training foreign students in our own country; of capital or physical goods; and of advisers. Maurice Strong, President of CIDA and formerly head of Power Corporation, is now expanding the agricultural operations.

Ironically, agriculture, the bloodline industry of new nations, has been the target of very little overseas aid, especially in Canada's program. "Less than 10 per cent of our aid was in agriculture," Dr. Bentley adds. Reasons for this lack stem back to the colonial powers and the establishment of elite power groups in new countries—controlling bodies far removed from the farmer in the fields.

"Requests for agricultural aid have had low priority, and have been badly understood." In efforts to change this situation during his year at CIDA, Dr. Bentley spent three months touring nations generating requests for agricultural aid, and suggesting new forms this aid might take.

Agricultural education, of course, is the most useful form of aid. But purely theoretical education is not enough. As Dr. Bentley has said, "knowledge of more productive methods of raising crops in the tropics will not in itself solve the food problem there." He advocates expanded agricultural training of a very practical nature, which he calls "the dirty hand" approach. Problems in assistance programs have arisen (*continued on page thirty-two*)



The campus reporter



Edmonton lawyer LOUIS A. DESROCHERS, LLB '52, is the new Chancellor of The University of Alberta. He succeeds the late F. P. Galbraith, LLD '59, whose term was to have expired June 30. Mr. Desrochers was nominated by a Special Advisory Committee and elected by the Senate at its May 15 meeting. He took office July 1 and will be installed sometime before Fall Convocation. (The portraits of Mr. Desrochers' two immediate predecessors hang behind him in this photograph: Laurance Yeomans Cairns, BA '12, LLD '55, and Dr. Galbraith.)

The millionth volume

The University Library has acquired its one-millionth volume, making this the fourth university in Canada with a library of one million volumes or more. The others are Toronto, British Columbia, and McGill.

The millionth volume, a gift from the Alumni Association, is *Notes of a Sporting Expedition in the Far West of Canada, 1847*, a rare piece of western Canadiana. It was presented to DR. WYMAN, President of the University, by MR. LAWRENCE, President of the Alumni Association, in a special ceremony on May 26 in the Cameron Library. Other participants in the ceremony were BRUCE PEEL, Librarian to the University, HENRY KREISEL, Chairman of the Library Committee, BRIAN McMULLIN, the Special Collections Librarian, and L. E. S. GUTTERIDGE, the Out-of-Print Librarian.

The sportsman author of the journal, Frederick Ulrich Graham, was the eldest son of the Right Honourable Sir James Graham, an English statesman.

In mid-April, 1847, Frederick Graham sailed from Liverpool on a hunting trip to western Canada. A month later he reached Sault Ste. Marie and, accompanied by Sir George Simpson, Governor-in-Chief of the Hudson's Bay Company territories in North America, set off by canoe, horseback, and cart for the West. He arrived at Fort Edmonton on August 11, and in spite of danger from parties of Blackfoot, he spent two weeks hunting bison south of Edmonton before returning to the East.

"I hate the sight of these forts," he wrote of Fort Edmonton in his journal. "Strange places like lumber-rooms on a vast scale. All the white men living in them look as if they had been buried for a century or two, dug up again, and had scarcely yet got their eyes open, for they look frightened when they see a stranger. The women are masses of fat, and speak nothing but Cree; and dogs and Indians wander about the large, dark, and filthy courtyards at pleasure—the latter so noiselessly with their moccasined feet, that, when you

sometimes sit down to write alone, on looking up, you find a circle of wild faces with their large black eyes, shaded by their long elf locks, fixed upon you, watching everything you do with great attention. Then no one can conceive the nuisance of the dogs. Each fort has a hundred or two of these devils, which, Harriot tells me, are necessary for the winter sleighing, and these roam about searching for food (they are never fed), the courtyard being a perpetual scene of growling, snarling, and yelping all day, and of lamentable howling choruses all night. The plains, the plains for me!"

Graham's journal was printed privately in 1898 by his widow, Jane Hermione Graham, for the benefit of their children and grandchildren. The number of copies printed is not known, although it is probably not more than twenty. Each copy is distinctly bound and inscribed to a member of the family by Lady Graham, the Library's copy to her sister-in-law, Agnes Graham.

When the University was established in 1909, the Senate allocated \$5,000 for the purchase of books for the Library. By 1911 the Library had acquired a collection of 11,000 volumes.

During its first half century the Library concentrated on building a good, up-to-date undergraduate collection. With the development of graduate programs in the late fifties, Library growth accelerated and a new emphasis was given to research collections. In 1957-58 the Library added 11,716 volumes; in 1969-70 it added 132,000.

The growth rate is expected to increase even further. By 1976, it may reach 2,000,000, and by 1981, 3,000,000.

Atlas of Alberta published

The *Atlas of Alberta*, after five years in preparation, was published in January by The University of Alberta Press. Designated a Centennial Project in 1967, the work was a co-operative venture between the Provincial Department of Lands and Forests and the University's Department of Geography.

The 13 by 17 inch *Atlas* is not simply

a collection of maps that mark the courses of rivers, locations of lakes, and heights of mountains. Rather, it covers an enormous variety of subjects that deal with virtually every facet of Alberta and its people.

The 158 pages of the *Atlas* contain 582 single maps, 188 graphs and diagrams, and eight profiles. Several maps fill two pages. Everything is depicted graphically, with a bare minimum of text.

The map on the endpapers is an unusual global projection centred on Edmonton and showing great circle distances between Edmonton and capital cities around the world. (A portion of this map formed the cover of the December, 1967, edition of *The New Trail*, which included an article on the production of the *Atlas* by JANUSZ KLAWE, Professor of Geography and *Atlas* editor.)

From the beginning the *Atlas* plunges into a consideration of Alberta more detailed than any regional study before it and probably more fascinating because of its colorful graphic exposition. A section on natural history traces prehistoric geology and landforms, looks at the Alberta climate, and surveys water use, vegetation, soils, and wildlife. An historical section follows, dealing with archaeology and native peoples, exploration and the fur trade, political evolution, land surveys, and early maps. Demographic maps show population arrivals and shiftings, vital statistics, religious and ethnic origins and distributions, and today's employment, income, and educational patterns. Thereafter the maps deal largely with economic concerns: farm size, value, labor, and products, forests, oil, gas, coal, and other minerals, electric power, manufacturing, services, settlement patterns, and government administration.

Data for the *Atlas* has come from the Alberta Bureau of Statistics, the Dominion Bureau of Statistics, the Alberta Research Council, professors and graduate students at all three Alberta universities, and various departments of the provincial government. Compilation of the statistical material was done primarily at the University, and final drafting was done by the Technical Division of the Alberta Department of Lands

and Forests and the Mapping Office, Survey Branch, Alberta Department of Highways and Transport.

The initial printing of the *Atlas of Alberta* was 10,000 copies, but there are indications that the publication will be forced into an early second edition to meet the high demand on it. The price to the public in Alberta is \$20 per copy; elsewhere it is \$30. Distribution within the province will be handled by the Department of Lands and Forests, and outside the province by the University of Toronto Press.

Down but not out

The old residence halls have a new lease on life.

Last December it was announced that Athabasca, Assiniboia, and Pembina Halls would be demolished to make way for a new graduate student housing project, as the old buildings were said too costly to renovate.

Now, however, W. D. NEAL, Vice-President (Planning and Development), says that "the whole matter has been deferred because finances are not available. The motion to demolish is up for reconsideration with the Board. Renovation will be reconsidered when

funds are available." In the meantime, Athabasca Hall will no longer be used as a male graduate student residence; it is considered unsafe. The ground floor will be used instead for academic offices. Assiniboia will continue to house the Department of English, and graduate women will still live in Pembina.

Athabasca, the University's first permanent home, was to have been torn down by the end of the 1969-70 academic year; Assiniboia was to be demolished in 1972, and Pembina was to follow shortly thereafter. Athabasca Hall was opened in 1911. Assiniboia followed in 1913, and Pembina in 1914.

Dr. Neal said that the possibility of alterations is still being explored.

Transplantation group established

This spring the Medical Research Council and the University formally approved the establishment of an MRC group for transplantation research in the Faculty of Medicine.

One and one quarter million dollars will be made available over a five year period to support research to be undertaken by

a team of scientists under the direction of JOHN B. DOSSETER, Professor of Medicine, and ERWIN DIENER. (The February, 1970, issue of *The New Trail* contained an article on "Transplantation and Immunology" by Dr. Dosseter, in which he referred to the planning of this group.)

Dr. Dosseter came to The University of Alberta last year from McGill University; he is Canada's leading authority on kidney transplantation. Dr. Diener, an immunobiologist of international reputation, will join the staff in July. For the past three years he has been Senior Research Officer at the Walter and Eliza Hall Institute of Medical Research in Melbourne, Australia. W. D. ARMSTRONG, who worked with Dr. Diener at the University of Melbourne, will be a full associate member.

Dr. Diener and Dr. Armstrong are pioneers in induction of immunological tolerance, a new approach to the problem of transplantation rejection and one of the specific projects of the group.

The group also will include a protein chemist in the field of isolation of transplantation antigens, an expert in the field of histocompatibility, and three professional assistants, W. T. HOWSON, *PhD* '66, and B. K. MOOKERJEE, former colleagues

Seven honorary degrees of Doctor of Laws and 2,741 regular degrees were conferred during the four sessions of Spring Convocation this year. Recipients of honorary degrees were: DONALD WALTER THOMSON, LLB '26, writer, geographer, and author of Men and Meridians; THEODORE LE SUEUR CAIRNS, BSc '36, Assistant Director of the

Central Research Laboratory of E. I. DuPont de Nemours and Company in Wilmington, Delaware; NEIL CAMPBELL, BSc (Mining Eng) '37, a mining and exploration geologist whose work brought about, among other things, the development of the Pine Point lead and zinc mines; MARGARET AGNES PARSONS, BA '34, an educational and community leader in





Dr. Kreisel

of Dr. Dosseter at McGill, and N. E. KRAFT, a former colleague of Dr. Diener. The program of the group will be integrated closely with an on-going clinical renal transplantation program which already exists at The University of Alberta. C. M. COUVES, HARRY HYDE, W. H. LAKEY, BSc '49, MD '53, and PETER SALMON of the Department of Surgery will be part-time associate members of the group.

The aims of the group are to develop basic and applied research in histocompatibility (that is, tissue typing and matching), preparation of donor-type transplantation antigens (tissue proteins that induce the formation of antibodies for use in tolerance induction in vitro in animals and eventually in man), serological and immunopathologic studies of the mechanism of rejection (the immunological effect of a graft in the recipient), and organ preservation, including perfusion and the freezing of solid organs.

This is the second MRC group to be established for the encouragement of intensive interdisciplinary research. The first was the MRC group for the neurological sciences established in 1967 at the University of Montreal under the direction of H. H. JASPER and now entering its fourth year

of operation. Under the terms of the agreements, members of the groups devote virtually their full time to their common research objective and are freed of the ordinary administrative duties of regular faculty members.

The financial contribution of the MRC to the new group makes provision for the salaries of the two principal investigators and of professional and technical assistants as well as for the stipends of a number of postdoctoral fellows and graduate students. In addition, during the first year of operation MRC funds for research equipment, materials, and supplies will total approximately \$100,000.

The University has made available over 7,000 square feet of laboratory space for the immediate members of the group. The sum of \$210,000 also has been provided locally for the renovation and capital equipment of laboratories for the directors of the group, and an undertaking to provide a further equivalent sum for equipment has been made.

The breadth and depth of the transplantation program to be developed by Dr. Dosseter and his colleagues is unique and the success of this endeavor well could set the pattern for other centres.

\$700,000 grant for new physics institute

A negotiated development grant of \$700,000 has been received by the University from the National Research Council to aid in the establishment of an interdisciplinary Institute of Earth and Planetary Physics.

J. A. JACOBS, Killam Memorial Professor of Science, will be Director of the Institute.

D. I. GOUGH, Professor of Physics, will be Associate Director, and K. D. HAGE, Professor of Geography, will be Acting Associate Director while Dr. Gough is on sabbatical leave next year.

The Institute will study three main areas: physics of solid earth; meteorology and physics of the lower atmosphere; and physics of the upper atmosphere and the outer environment of the earth.

Dr. Jacobs hopes the Institute will contribute to the understanding of such things as global pollution by adding to knowledge of the earth, the atmosphere, and the physics of our environment generally.

Vice-President (Academic) appointed

HENRY KREISEL, Professor of English and Acting Dean of Graduate Studies, has been named Vice-President (Academic) by the Board of Governors, effective July 1, 1970. He succeeds A. G. McCALLA, BSc (Ag) '29, MSc '39, who assumed the position on a temporary basis last September when MAX WYMAN was appointed President of the University. Dr. McCalla has resumed his duties as Dean of Graduate Studies.

Dr. Kreisel was born in Vienna in 1922. After he escaped Nazi-occupied Austria in 1938, he was interned in England and sent to Canada in 1940. He obtained his BA in 1946 and his MA in 1947 from the University of Toronto, where he was awarded ten major scholarships during the course of his studies; he received his PhD from the University of London in 1954.

He joined the Department of English at

Red Deer; LAURA MARGARET ATTRUX, for more than thirty years a nurse serving remote communities in northern Alberta; FREDERICK CHARLES MANNIX, a noted Alberta contractor and businessman; and SIR HAROLD MITCHELL, President since 1934 of Luscar and Mountain Park Coal Companies. Six of the honorary graduands have attended The University of Alberta.





Dr. McCutcheon
Dr. Bain
Mr. Gallagher
Mr. Raven

The University of Alberta in 1947 and was Head of that Department from 1961 to 1967. He was Senior Associate Dean of Graduate Studies from 1967 to 1969. In September, 1969, he took on the duties of Acting Dean of Graduate Studies while the Dean served as Acting Vice-President (Academic).

Dr. Kreisel has served on a variety of major committees at university, provincial, and national levels, notably the Canada Council Board of Judges for Arts Fellowships, the Canada Council Post-graduate Scholarships Committee for English Literature (Chairman, 1963 to 1965), the Executive of the Humanities Association of Canada, and the Governor General's Awards jury for Literature (1966 to 1969). In 1960-61 he was President of the Association of Academic Staff of The University of Alberta. When the Universities Act of 1966 admitted academic staff to the Board of Governors, Dr. Kreisel was one of the first two faculty members elected to the Board by the General Faculty Council; he served for a three-year term of office, from 1966 to 1969.

A Canadian author of some note, Dr. Kreisel has written two novels, *The Rich Man* (1948) and *The Betrayal* (1964), plus a number of short stories published both in periodicals and in leading anthologies, in addition to critical essays and other articles. In 1960 he was awarded the President's Medal of the University of Western Ontario for the best story published in Canada that year.

Appointments

JAMES McCUTCHEON of Montreal has been appointed Dean of Dentistry effective July 1. He succeeds H. R. MacLEAN, DDS '28, who retired this spring after thirty-five years on staff.

Dr. McCutcheon has been Dean of Dentistry at McGill since 1956, as well as Dental Surgeon in Chief and Director of the Department of Dentistry at Montreal General Hospital. He is a Fellow of the Royal College of Dentists of Canada, the American College of Dentists, and the International College of Dentists. He has served in various executive

capacities in the Canadian Dental Association, the Canadian Academy of Prosthodontics, the American Academy of Dental Medicine, the Academy of Dental Sciences, and the Fédération Dentaire Internationale.

GORDON O. BAIN, BSc '49, MD '51, Professor of Pathology, has been appointed Chairman of that department, succeeding J. W. MacGREGOR. The appointment is for a five year term, beginning September 1.

In 1957, after completing his certification in Pathology, Dr. Bain was appointed Assistant Professor of Pathology, and Pathologist to The University of Alberta Hospital and the Provincial Laboratory. In 1965 he became a member of the Medical Research Council of Canada and the MRC Grants Committee on Pathology, Bacteriology, and Immunology.

JAMES E. GALLAGHER, Bed '56, MEd '64, Associate Professor of Industrial and Vocational Education, has been appointed Chairman of that department effective July 1.

He succeeds HENRY R. ZIEL, who resigned as Chairman but will remain on staff as Professor of Industrial and Vocational Education.

Born in Lamont, Alberta, and educated in Edmonton, Professor Gallagher joined the staff of the Faculty of Education in 1963. He has extensive industrial experience and has served as a consultant to both industrial and educational organizations. He holds a Senior Specialist Certificate in Woodworking and a Journeyman's Certificate in Carpentry and Joinery and at present is completing his doctorate at the University of Illinois.

J. W. RAVEN was appointed Director of Housing and Food Services as of April 1 this year. He had served as Acting Director since last December following the resignation of D. A. BONE, BA '64, from that position.

Mr. Raven has attended the University of Saskatchewan and has considerable previous experience in private industry. He joined the Housing and Food Services staff in 1967.



A ceremonial mace was presented to the University at Spring Convocation by MICHAEL GALBRAITH, BA '62, the late Chancellor's son. It will be carried before the Chancellor in procession and will rest on its stand during Convocation ceremonies.



Dr. Galbraith
at Convocation

DEATHS

Francis Philip Galbraith 1896-1970

Excerpts from *The Red Deer Advocate*
Saturday, May 16, 1970

Dr. Francis Philip Galbraith, publisher of *The Red Deer Advocate* and retiring Chancellor of The University of Alberta, died this morning [May 16]. He was 73.

He was stricken in the home which has been the family residence since 1907, and died about 7 a.m. in Red Deer General Hospital.

He had just returned from meetings in Edmonton of The University of Alberta Senate. There, he had been honored for his services to the University as Chancellor for the past six years. The meeting had also selected his successor, Louis Desrochers, an Edmonton lawyer. Dr. Galbraith's term as Chancellor was to expire at the end of June.

Later this month, he was to have presided at his final series of Convocations. He had planned a presentation to the University during the ceremonies, was to have conferred an honorary doctorate on another Red Deer citizen, Mrs. W. B. Parsons, and in turn was to have been honored with a formal tribute from Dr. Max Wyman, University President.

Dr. Galbraith—he received his honorary degree from The University of Alberta in 1959—had been publisher of *The Red Deer Advocate* since 1934. He had relinquished the companion title of Editor in March this year

but continued to be among the earliest arrivals at the office each day.

In the last decade and a half, he had successfully led *The Advocate* through a transition from weekly to bi-weekly to daily. His was among a handful of newspapers in Canada which had successfully attempted the change since the Second World War.

Mr. Galbraith—who preferred his doctorate to be used only for academic occasions—was generally credited with being one of the hardest-working Chancellors the University has had. He was elected to the post by the alumni in August of 1964, and was the first Chancellor who was not a resident of Edmonton or Calgary.

Francis Philip Galbraith was born on December 14, 1896, in Guelph, Ontario, where his father, the late F. W. Galbraith, had worked for 23 years on that city's daily newspaper, *The Guelph Mercury*, before moving to Red Deer in 1906 to begin the family's newspaper history here.

In Red Deer, the young "Phil" Galbraith attended school with many chums who also were to distinguish themselves later, including Governor General Roland Michener.

As a lad not yet in his teens, Phil Galbraith was in a Scout troop which tracked down a gunman in some bushes near the Exhibition Grounds after the bandit had shot Red Deer's police chief. For that heroism by the troop, Scout Galbraith was sent to Britain to represent his troop at a Jamboree.

He began working for his father at the weekly *Advocate* after school hours and on weekends in his teens. He had been actively associated with the business since, except for the years he spent serving overseas during the First World War with the Canadian Expeditionary Forces and then working in Britain.

He attended The University of Alberta from 1913 to 1915, when he left the Faculty of Applied Science to enlist and go overseas. He served with the Princess Patricia's Canadian Light Infantry for four years.

In the early '20s, Mr. Galbraith went to Britain and worked there for eight years, returning to Red Deer and *The Advocate* in 1931.

When his father died in 1934, Phil Galbraith succeeded him as the Publisher and Editor.

Mr. Galbraith became a leader in the weekly newspaper field. He had served as president of both the Canadian Weekly Newspapers Association and the Alberta Weekly Newspapers Association. Under him, *The Advocate* won many national and provincial prizes for excellence.

Mr. Galbraith spearheaded the attack of Alberta's weekly newspapers against provincial legislation in the late 1930's to control the press. That legislation ultimately was declared ultra-vires.

The battle brought to Alberta's weekly newspapers the only Pulitzer Honorable Mention awarded to weekly newspapers outside the United States. Mr. Galbraith represented this province's weeklies to accept the award.

Always keenly interested in all community affairs, Mr. Galbraith served two terms as a city alderman.

As its first chairman, he headed the newly-formed Red Deer District Planning Commission from 1952 to the end of 1957. That was the first planning commission in Alberta.

He served on the Senate of The University of Alberta from 1948 until 1954.

One of the more recent honors that came to him was a Canadian Centennial Medal.

Dr. Wyman, speaking from the University, said "His death represents a great loss to me



Dr. Warren

personally, to the University and to the people of Alberta. As Chancellor of The University of Alberta, he sought quality and excellence in its instructors, buildings and facilities."

Said John Dauphinee of Toronto, general manager of The Canadian Press: "Dr. Galbraith exemplified the finest qualities of the prairie pioneer. His vigor, friendship and dedication to high principles . . . were reflected in his full co-operation as a member of The Canadian Press for a decade."

Mr. Justice E. W. S. Kane of the Alberta Supreme Court, Appellate Division, and an old friend of Dr. Galbraith, said he "was a magnificent character in every sense of the word. In the newspaper business, and anything else he put his mind to, he was steady, honest, fair and had a fine sense of the fitness of things."

Percival Sidney Warren

1890-1970

By C. R. Stelck

Professor P. S. Warren died in Edmonton on February 23, 1970 after a short illness.

Dr. Warren, a long time popular lecturer in Geology at the University, was known as the dean of western Canadian stratigraphers by the geological fraternity in Alberta. He laid the foundations of the studies of the oil-bearing strata in the west by his pioneer explorations in Jasper, Banff, and the Crowsnest Pass and a great number of the foremost geologists in western Canada are numbered among his students.

Dr. Warren was born in Brechin, Ontario, and turned to school teaching as a means of getting enough money together to go to University. There were outcrops with fossils

C. R. Stelck, BSc '37, MSc '41, Professor of Geology, was student and later colleague of Dr. Warren, and with him co-authored several research publications in biostratigraphy, exploration, and micropaleontology.

on his parents' farm and his interest in geology had early beginnings.

The Great War took him to Europe and the Battle of the Somme where he was wounded; this earned him the opportunity to attend the University of London in England. He never lost his connection with the military scene and for many years he lectured in military history. His chief specialty was the Peninsular Campaigns of Wellington. During World War II he was Colonel in charge of the Canadian Officers Training Corps at The University of Alberta and the Honour Rolls of World War II carry the names of those who were his students in University.

After returning from the Great War, he took his BA and PhD in Geology at the University of Toronto, where he studied under the great paleontologist, Dr. W. A. Parks. His doctoral thesis was on Banff, as the National Park authorities were greatly concerned with the fluctuations in the hot springs flow and asked Dr. Warren to investigate the source of the springs. He continued his investigations into the fossils of western Canada from this time on, supporting his own research out of the small salaries paid to professors in those years.

Dr. Warren came on the staff of the University in 1920 as Lecturer and rose through the levels to become Professor of Stratigraphy in 1934, and Head of the Department of Geology in 1949. In 1955 he retired from the headship and became Professor Emeritus although he continued to teach for many years and was active with his fossils until shortly before his death. During his long career in the University he served in many offices. He was Provost during the post war years when the veterans were returning to school. He was long time Chairman of the Men's Athletic Board and was one of the most avid fans of inter-collegiate sports. His own athletic interests had included cross country running when he was young, but most of the young members of the University staff remember him as a canny badminton player until well on into his 70's.

He acted on the advisory boards of the Research Council of Alberta in the critical years of its resurgence as an important scientific centre. His calm mediation advised

many committees within the University and there were very few that he was not on at one time or another.

In the field outside of the University, he became one of the group that founded the little theatre movement in Edmonton. He was a long time patron of the Edmonton Symphony Society and the Women's Musical Club, and was always to be seen in his aisle seat at the Celebrity Concerts.

He was the author of some hundred critical scientific publications, and was associated with the Geological Survey of Canada and Research Council of Alberta on many of these.

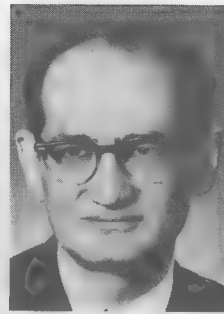
He was a charter member (in 1928) of the Alberta Society of Petroleum Geologists, and remained an honorary member of that society until his death. He was an honorary member of the Edmonton Geological Society from its inception; the society awards a P. S. Warren Prize for papers of distinction and for academic achievement the P. S. Warren Prize for Introductory Geology. The student geological society in the University is known as the P. S. Warren Society.

Dr. Warren was a long time member of the Paleontological Society, the American Association of Petroleum Geologists, and a fellow of the Geological Society of America. He was elected to fellowship in the Royal Society of Canada in 1931, becoming the President of Section 4 of the Royal Society in 1950.

Dr. Warren was a gentleman of the old school, a gentleman in manners, a gentleman in debate, and ever a gentleman in his disciplined scientific writings. He kept an open mind toward new evidence in paleontology and stratigraphy but never felt obligated to shift from a logical position merely because a new theory was presented. Each theory had to meet the test of natural history observation. He also applied this rule to his own writings thereby making his office a mecca for debate by international travellers.

In distant lands The University of Alberta was known as "the place where Warren is" and yet Dr. Warren himself travelled very little and never in a global sense.

His wife, the former Evelyn Runcinan,



*Dr. Spaner
Dr. Moser
Mr. Routledge*

predeceased him in 1951. He is survived by his two daughters, Margaret (Mrs. R. B. Ferguson) of Winnipeg and Mary (Mrs. J. E. Campbell) of Edmonton, and by four grandchildren.

Sidney Spaner 1912-1970

By Julius Guild

Sidney Spaner, BA '33, MD '37, Clinical Professor of Psychiatry, died May 4. He had been on the staff of the Faculty of Medicine and the University Hospital continuously since his qualification in psychiatry, except for the period 1940 to 1946, when he served with the Royal Canadian Air Force.

Sidney Spaner was an insatiable student of psychiatry, or perhaps more truly, of people. As a teacher, his sense of fun, his wit, the informal way he taught, and his intense sincerity about his field endeared him to his students.

He delighted in creating the impression, in which he often succeeded, of being somewhat disorganized. But behind his professional skill lay a diligent, persistent, scholarly thoroughness which made it possible for him to appear to lecture "off the cuff."

He was a rebel against medicine when it sacrificed the patient for the illness; against orthodoxy when it hampered freedom; against conformity for its own sake or when it stifled individuality; against his own body when it could not meet the demands he made upon it.

He had the unusual ability to emphasize the positive, the constructive, and the creative in people, and to bring out the healing capacity of love in the troubled and alienated.

He never forgot a simple biological fact: the essential humanness of human beings.

Julius Guild, MD '46, Associate Clinical Professor of Psychiatry, was for many years a colleague of Dr. Spaner.

Leo Moser 1921-1970

By Max Wyman

Leo Moser, Professor of Mathematics, died February 9 after a lengthy illness. He was born in Vienna in 1921 and attended the Universities of Manitoba, Toronto, and North Carolina. He joined the Department of Mathematics in 1951.

Leo Moser had talents unique among mathematicians I have known personally or through their published works. Above all he demonstrated an amazing ability to analyze the most complex mathematical problems. Because of his consistent and ingenious use of elementary analysis, his contributions to more than a hundred research publications show a simplicity and clarity rarely found in the work of other mathematicians.

Gifted with a well-developed sense of humor and many of the attributes of a successful actor, he made mathematics a fresh and living subject to large classes of beginning students. At the same time he could completely captivate smaller groups of professional mathematicians who are prone to be critical of the work of their peers.

One of his most notable hobbies was chess, and he spent many hours playing chess with high school students, often playing simultaneously as many as fifty games.

He loved people and people warmed to him. He loved mathematics and was prepared to share his ideas with anyone who cared to listen. It delighted him that many of his ideas were developed by those who listened to him, and his best monuments are the literally hundreds of young people who were influenced by him to continue their education beyond the elementary level.

Dr. Wyman and Dr. Moser were close friends and colleagues in the Department of Mathematics for almost twenty years. As specialists in related fields they published jointly a number of scientific papers.

Robert Henry Routledge 1915-1970

By H. J. McLachlin

Robert Henry Routledge, BEd '48, MEd '61, Associate Professor of Physical Education, was slain in Calgary on April 25. At the time of his death he was preparing to attend a meeting of the Alberta Schools Athletic Association to which he was the representative from The University of Alberta.

Professor Routledge was born in Loughheed, Alberta, in 1915. He received his early education in Hardisty and in 1933-34 attended the Camrose Normal School, after which he taught in a one-room rural school. Always interested in health and physical education, in 1939 he became Provincial Supervisor of the Canadian Youth Training Plan, forerunner of the present Recreation Branch of the Department of Youth.

During World War II he served as a navigator in the Royal Canadian Air Force and was awarded the Air Force Cross for distinguished service.

Following the war he studied at The University of Alberta and taught in schools in Edmonton. In 1958 he was appointed Assistant Supervisor of Physical Education for the Edmonton Public School Board, a position he held until he joined the staff of the Faculty of Physical Education in 1967.

He was forever devising ways and means of getting people involved in intramural athletics. His models of intramural and house league programs have been copied all over Canada. He was instrumental in founding the Health and Physical Education Council of the Alberta Teachers' Association, the Alberta Schools Athletic Association, and the Canadian Federation of High School Athletic Associations. At the time of his death he was the Vice-President of Physical Education for the Canadian Association for Health, Physical Education and Recreation.

H. J. McLachlin is Associate Dean of Physical Education.

An Important Announcement to Alumni

In view of continuing public fund raising activities at the University it has been decided by mutual consent that in order to avoid duplication and misunderstanding the Alumni Association should discontinue its established pattern of soliciting regular annual gifts from members of the graduate family.

In order to meet the Association's financial requirements, and to permit the Association to focus increased attention on identification and communication with members of Convocation, with heightened involvement in the life of the University, and with matters generally concerning post-secondary education, additional funding will be provided by the University.

Henceforth, no regular appeals of a financial nature will be made to alumni by the Alumni Association. Instead, appeals for funds to assist the University will be made regularly by the University's Fund Development Office. For these we urge your continuing active participation and generosity.

Contact with members of the graduate family now living in Canada and abroad will be maintained through the medium of *New Trail*, regular copies of which will be mailed to all alumni for whom the University has current addresses.

Max Wyman

President
The University of Alberta

G. Lawrence

President
Alumni Association

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The University's graduates and friends are encouraged to keep in touch with the Alumni Association. If you are able to help organize alumni activities—in Edmonton or another centre—please let us know. Tell us about your personal doings too.

Write (or telephone) the Alumni Association (432-3224) at the University.

When Alberta's graduates are mentioned in NEW TRAIL, their degrees and graduating classes are listed after their names. Many also have degrees from other universities, but these are not generally shown.

Alumni Association Executive

Honorary President, MAX WYMAN, BSc '37
(President, The University of Alberta)
Honorary Secretary, ALEX D. CAIRNS, BA '38
(Registrar, The University of Alberta)
President, NORMAN A. LAWRENCE, BSc (Eng) '41
Vice-President, C. A. KOSOWAN, BA '50, LLB '51
Past-President, C. LES USHER, BSc (Ag) '49
Executive Secretary, ALEX G. MARKLE,
BA '48, BEd '62, MEd '65

CYRIL J. McANDREWS, BSc (Ag) '50
W. A. D. BURNS, BA '51
W. J. ASTLE, BComm '46
W. MELVIN TASKEY, BSc '54, DDS '56
D. J. CORSE, Ed '51
RALPH N. McMANUS, BSc (Eng) '42, MSc '46
DONALD R. STANLEY, BSc (Eng) '40
Miss EVANGELINE MacDONALD, BSc (HEC) '57,
BEd '59
E. G. KIDD, BSc '43, MD '45
Mrs. OLIVE HAMILTON, Dip Nurs '43
A. J. ANDERSON, BSc (Ph) '41
LEE S. FAIRBANKS, BEd '54, MA '66
CAMBY GILLESPIE, BSc (Ag) '36
HARRY P. CHOMIK, BEd '50, BA '56, MEd '64
BOB EDGAR, BSc (Ph) '55
Mrs. ANN CORNETT, BSc (HEC) '36

Alumni annual meeting

A blueprint for University of Alberta Alumni action in the 70's was drafted at the Thirty-first Annual Meeting of the Alumni Council in May.

For the first time the Association endeavored to place its philosophy on paper. This and other fundamental subjects such as objectives, structure, and financing were scrutinized in depth. A "white paper" encompassing the several viewpoints of delegates from Victoria to Montreal is being compiled for circulation to all alumni branch executives and graduates generally on request.

One of the interesting areas into which the alumni executive ventured in 1969 was that of studying and making submissions on matters of current concern to the University. Included were briefs on supplementary remuneration and income of University staff, the matter of an University ombudsman, financing of the University, and a brief to the Worth Commission on Educational Planning. In addition a study was conducted on

the level of graduate interest in an alumni centre on campus and the expanded use of University facilities by alumni.

During the year the Association co-operated with the University in advancing the 3AU Capital Fund campaign. Alumni were encouraged individually and collectively to support the program. It would appear that the University wishes to make direct contact with alumni annually in the solicitation of funds. In view of this, and in order to avoid confusion through a proliferation of fund appeals, it has been decided by mutual consent that the Alumni Association should vacate the area of public fund raising entirely. A statement explaining this, appears on the opposite page.

The alumni year brought to light a number of things. Perhaps the most important was the need for better communication within the Association to individual members. In part this need stems from the rapidly increasing number of alumni and in part from the growth

and changes taking place at the University itself. By way of strengthening communication all out-of-province branches were visited and principal alumni officers and branch executives met to evaluate the purposes of alumni branch organization and the position and role of branch units within the General Alumni Association.

An interesting suggestion approved at the Annual Meeting was the proposal to establish a national organization of alumni associations at universities across Canada. Such a group could provide the necessary framework through which national opinion of professional people could be presented. It was agreed that the local association should take the lead in hosting the first meeting of this organization.

In his report retiring Alumni President C. LES USHER noted that "... it is now opportune for the Association and individual alumni to become more deeply involved in the life of the University. Part of this involvement must surely be financial but perhaps equally important is involvement in time and talent, in helping guide and direct the development of the University."

To accomplish this it was agreed by Council that there must be closer liaison with the academic community. This could be



The Alumni Council took time off from its Annual Meeting in May to have a picture taken together. IN THE FRONT ROW (left to right) are: Miss Evangeline MacDonald, BSc(HEC) '57, BEd '59; Mrs. Irene Eskildsen, BSc(Nurs) '65; Mrs. Jean Shimizu, Dip Nurs '57; Mr. Usher, President of the Association; the late Dr. Galbraith; Dr. Wyman; Mr. Lawrence, Vice-President of the Association; Mrs. Sheila Maxwell, BA '48, Vancouver; Roger Flumerfelt, BComm '42, Montreal; Mrs. Ann Cornett, BSc(HEC) '36, Red Deer; and, in the shades, Mr. Markle. IN THE BACK ROW are: W. A. D. Burns, BA '51; M. Taskey, BSc '54, DDS '56; C. J. McAndrews, BSc(Ag) '50; A. D. Cairns, BA '38; B. Michalyshyn, MD '42; G. Buck, BSc(Eng) '58, Victoria; R. Lindsay, BComm '54, Toronto; C. Kosowan, BA '50, LLB '51; R. McManus, BSc(Eng) '42, MSc '46; P. Ritchie, BSc '49, Saskatoon; and B. Watson, BA '64, Ottawa.

Branches

CALGARY—Chairman, CAMBY GILLESPIE, *BSc* (4g) '36, 2641 - 5 Avenue N.W., Calgary; Secretary, KEN OLIVER, *BSc* (Pharm) '54, 3408 Cascade Road, Calgary.

CAMROSE—Secretary, Miss MARGIE McCREA, *BSc* '43, 4710 - 47 Street, Camrose.

CENTRAL ALBERTA—President, Mrs. ANN CORNETT, *BSc* (HEc) '36, 4416 - 43 Avenue, Red Deer; Secretary, MORRIS FLEWWELLING, *BEd* '64, 4126 - 35 Street, Red Deer, Alberta.

DENTAL ALUMNI ASSOCIATION—President, W. M. TASKEY, *BSc* '44, *DDS* '56, 505 Tegler Building, Edmonton.

GRANDE PRAIRIE—President, PAUL LEMAY, *BSc* '63, *MSc* '65, 10129 - 113 Avenue, Grande Prairie.

MEDICAL ALUMNI ASSOCIATION—President, G. S. BALFOUR, *MD* '43, 430 Mayor Magrath Drive, Lethbridge.

MEDICINE HAT—President, JACK ARMSTRONG, *BComm* '49, 158 Cochrane Drive N.W., Medicine Hat; Secretary, B. KRASNOFF, *DDS* '43, 250 - 4 Avenue S.W., Medicine Hat.

MONTREAL—President, J. R. FLUMERFELT, *BComm* '42, District Manager, London Life Insurance Co., 630 Dorchester Boulevard, Montreal.

NURSES' ALUMNAE ASSOCIATION—President, Mrs. PATRICIA HAUGEN, *Dip Nurs* '57, 11740 - 37 Avenue, Edmonton.

OTTAWA—President, BRIAN WATSON, *BA* '64, No. 14, 130 Woodridge Crescent, Ottawa.

Secretary, Mrs. JILL BODKIN, *BA* '63, 285 A Clemow, Ottawa.

REGINA—Chairman, Mrs. RUTH M. HARGRAVE, *BA* '33, 3525 - 17 Avenue, Regina.

ROCHESTER, MINNESOTA—Registrar, GEORGE D. MOLNAR, *BSc* '49, *MD* '51, Mayo Clinic, Rochester, Minnesota.

SASKATOON—Chairman, PETER D. RITCHIE, *BSc* '49, No. 803, 105 - 21 Street E., Saskatoon.

TORONTO—President, ROBERT B. N. LINDSAY, *BComm* '54, 22 Glentworth Road, Willowdale 427, Toronto; Registrar, Mrs. F. J. HEATH, *BA* '38, 284 Dawlish Avenue, Toronto 317.

well served not only by representation on the Board of Governors and University Senate as at present but by delegates serving also on General Faculties Council.

Alumni Council sessions were not all business but were interspersed with luncheons and evening social events. On the closing day a Red Deer lawyer, J. W. BEAMES, *BA* '52, *LLB* '53, was elected to serve a three year term as Association representative on the University Senate.

One of the annual highlights of the Alumni Meeting conference is the Board of Governors luncheon for delegates. This year luncheon speakers included the President of the University, MAX WYMAN, and the late Chancellor F. P. GALBRAITH. The Burgess Trophy for the best all-round alumni branch was presented to GEOFFREY BUCK, *BSc* (Eng) '58, president of the Victoria unit.

Homecoming is coming

The Alumni Association's annual Homecoming festivities will be held October 16 and 17 this year. All the University's graduates are invited, especially those from the gold and silver classes of '20 and '45, and the other anniversary classes of '30, '40, '50, '60, and '65. The Governor-General, ROLAND MICHENER, *BA* '20, *LLD* '67, plans to be here. You come too.

The Burgess Trophy for the most active Alumni Branch program was presented to the Victoria Branch this year. Here is GEOFFREY BUCK, Branch President, showing off his prize to three admiring Edmonton ladies, EVANGELINE MACDONALD, left, JOAN SHIMIZU, and OLIVE HAMILTON, at the Association's annual meeting.



Fred Bentley

(Continued from page twenty-one) because many foreign students either do not return to their native lands, or find that their knowledge from temperate region education is of little use in the tropical situation. Oftentimes the advice of outside specialists is difficult to implement. Hence, field personnel, students, and specialists should "get their hands dirty" in the soil of the country they aim to help.

Many advances have been made, but even with increased productivity and greater areas of the world being devoted to agriculture, the food level per capita is just being maintained. "There has been no net improvement in food supply during the past two decades," Dr. Bentley states. The reason is the enormous world population expansion. Food aid which is now being provided is having the effect of increasing the numbers of persons living at subsistence level. This growing population is depending on aid which may not always be available. The final responsibility, then, of the aid-giver is to attempt to control population expansion as well as to increase food production.

It becomes obvious as he continues to talk, and becomes more vehement in stating his concern, that it is *people* who are most important to Fred Bentley. There are students waiting in the hall, and Fred Bentley packs up his books. He is off to plant crops, to get his hands in the Alberta soil. Reaching out to people all over the world through agriculture, Professor Bentley takes the University back to the land.

Tuck Shop

(Continued from page nineteen) roof made. He had the pillars cut off the front—discovering that they had been built with steel car wheel rims around the bottom. All the aging bentwood chairs and tables were removed from the dining room, and booths were installed.

The rag-tag structure, which, as Mr. Gerhart says, "grew like Topsy—piece by piece," had a corner for every permissible

VANCOUVER—President, Mrs. SHEILA G. MAXWELL, BA '48, 4550 West 7th Avenue, Vancouver; Secretary, Mrs. SHEILA ROBERTSON, BSc '45, 1810 Rosebery, West Vancouver.

VEGREVILLE—President, HARRY P. CHOMIK, BEd '50, MEd '64, 4334 - 41 Street, Vegreville.

VICTORIA—President, GEOFF BUCK, BSc (Eng) '58, 3908 Benson, Victoria; Secretary, Mrs. ALICE BREWER, BSc (HEC) '27, 2629 Peatt, Victoria.

WESTLOCK—President, BOB J. EDGAR, BSc (Pharm) '55, Box 990, Westlock.

WINNIPEG—Chairman, A. M. LARSON, BSc (Ag) '49, 526 Manchester Blvd., Fort Garry 19; Secretary, MARVIN SEALE, BSc (Ag) '48, MSc '51, 195 Lyndale Drive, Winnipeg 8.

University activity, and then some. There was a dance hall in the basement, "The Rainbow Room," which served as well to hold the meetings of many campus organizations. Marathon bridge games went on here in the basement—the kind of games which sometimes made academic and financial failures. Students made reservations months ahead of time to paint advertisements for campus functions on the mirror-walls in the dining room. Kick-lines for promotions and political campaigns were likely to give diners a floor show with their meal. Yet amidst all this activity there must have been quiet moments, romantic times. Mr. Gerhart recalls being visited by a couple, married ten years since the husband proposed to his future wife over the table in Tuck.

The Tuck Shop gave incomparable service to the University community. "We were open 362 or 363 days a year, from 7:30 a.m. to 11 p.m. As a non-University business we served as a good yardstick on prices. And we aimed at individual service—we did what we could to give each customer what he wanted even if it weren't the most profitable practice. In the long run, we built up a good business."

One professor from those days remembers Gerhart's service. The Tuck owner ordered Pelican paperbacks directly from England instead of the poor quality books that usually filled booksellers' shelves. To the delight of University staff, he eventually arranged to have the entire catalogue in stock.

The Tuck Shop continued its established tradition of "extra curricular" activities. There were some close scrapes with the law—like the time when the police made a crackdown on Sunday selling.

"We sold everything, I make no apologies for it. We were there, available. One Sunday a lady came in and bought two great armloads of things. As she left, two policemen courteously opened the door for her, and accompanied her to her car. They asked to see what she'd bought. Together they went through the entire load of purchases making a lengthy list. When they finished the lady calmly said: 'I don't see what the problem is. What business is it of yours? Can't I go into my own store and get a few things?'" The

lady was Edgar Gerhart's mother. The policemen took their leave.

Yes, Tuck has had a charmed existence. A few burglaries were attempted, but with little success. Once an armed would-be robber appeared in the kitchen. He waved his gun about trying to shush the European ladies who worked there. The more he waved, the more they screamed. His nerves gave way, he fired into the ceiling and ran out the back door.

Mr. Gerhart gave up the pharmacy business when he began to study law, but still held

the store and restaurant until 1968 when it was taken over by the University Food Services. The drugstore area was emptied but the cafeteria operated still. Law students, dents in their white uniforms, and many long-haired coffee-drinkers still crowded the round booths gesturing through the smoke.

Last winter session, 1969-70, was the final year of Tuck. It had suffered a slow decline in the past few years, dwarfed by the campus which once had centred around it. Now it is gone, one of our best-loved traditions, and with it an era.

Campaign Report

Halfway there

According to the latest figures, pledges to the 3AU campaign now total more than twelve and one half million dollars, over half its goal of twenty-five million.

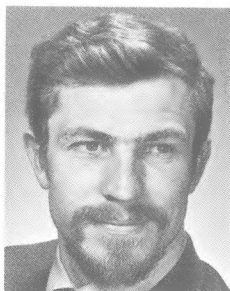
"Although twelve and a half million is perhaps a long way from our objective," LORNE MACPHERSON, Fund Development Officer said, "it is a very respectable showing so far, considering that the stock market and high interest rates have forced the majority of Alberta businessmen and other individuals to

postpone making commitments to the campaign."

Campaign committees and University officials are optimistic that when the economy picks up and funds become more available these problems will resolve themselves.

Some divisions are less affected by the economic climate than others. The national corporations division, chaired by F. G. WINSPEAR, LLD '51, has reached 95 per cent of its goal, and professional persons, particularly alumni, also are very close to their objective. Mr. MacPherson paid tribute to the volunteers who worked hard to put the fund where it is.

New campaign plans have been drawn and include a further intensive solicitation of major Alberta donors and the development of annual giving programs to seek support from individuals and small corporations.



Last Fall, a Fund Development Office was established at The University of Alberta to carry forward the work of the Three Alberta Universities Campaign, and to seek additional non-governmental sources of financial support for the operating and capital needs of the three Universities. LORNE MACPHERSON, formerly the Assistant Director of the 3AU Campaign responsible for the Edmonton region, now is Fund Development Officer. A graduate of the University of Saskatchewan and experienced in fund raising in the United States, he was Assistant to the Director of Development at the University of Saskatchewan and, more recently, an associate of the fund raising consulting firm retained by the 3AU Capital Fund.

